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PATHOLOGIC CHANGES IN SENILE PSYCHOSES AND THEIR PSYCHOBIOLOGIC SIGNIFICANCE.*

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(With the Technical Assistance of MISS M. A. TRAINOR.)

In any scientific study the limitations as well as the advantages of the method of approach to the problem should be fully appreciated. The value of pathologic research in psychiatric fields is too well known to require discussion here. Its contributions have in fact been so striking that there has been a tendency to forget that pathology can explain only certain aspects of mental disease. As expressed in the fundamental formulation of Hughlings Jackson, destructive lesions of the central nervous system directly produce negative effects or loss of function only. The positive symptoms, which are displayed in the active performances of the patient, are to be attributed to activity of the preserved portions of the organism, representing its attempts to adjust to the altered situation. In the field of neurology this viewpoint has been developed by Goldstein [1] particularly. In dealing with mental disorders from the same angle, we are approaching the field of psychopathology, which, as Malamud [2] has pointed out, studies symptoms of disease as indicative of a new person that has come into being and as expressions of his effort to adjust to the new set of circumstances in which he finds himself. It should be a function of pathology to define certain abnormal situations with which the organism is obliged to deal, thereby opening the way for a study of the reactions and responses of the sick person to definite types of difficulty. It is with this idea in mind that the present pathologic study of senile psychoses has been undertaken.

There has been a widespread tendency in dealing with senile psychoses † to look on the anatomic changes in themselves as a satisfactory explanation of the whole mental disorder, as a result of

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† The conditions included under the term senile psychoses are those conforming to the definition adopted by The American Psychiatric Association and by most of the mental hospitals in this country.

which little effort is made to pursue the investigation further. It may, perhaps, be asserted that the loss of function predominates to such an extent in senile dementia that nothing else matters. This is the prevailing attitude towards the subject. Yet it has become increasingly clear in the course of previous work with Kasanin [3] and during the present investigation that isolated consideration of the anatomic changes fails to solve some of the most important problems of senile psychoses. When the pathologic changes are considered psychobiologically in relation to the living person in whom they are occurring, their significance for the sick person appears in a new light, and certain conceptions of the loss of function arise which seem to be of sufficient interest to merit discussion.

There has been no review of the pathology of senile psychoses in the American literature for many years, though some features have been discussed in previous communications.[3, 4] The study of Simchowicz [5] reported from Germany in 1911 is still the classical work on the subject. Among early writers, Fischer [6] and Spielmeyer [7] have made important contributions. Numerous papers, such as those of Fuller,[8] Tiffany,[9] Schönfeld [10] and Uyematsu [11] have been chiefly concerned with the occurrence of senile plaques in the brains of patients with senile dementia. A detailed description of cyto-architectural changes was reported by Oseki.[12] In recent years Grünthal [13] has contributed the outstanding work dealing with the complete neuropathologic picture of senile dementia. Critchley [14] has ably discussed normal senility and its pathologic aspects in a broad study which provides an excellent historical review and an extensive bibliography. A conspicuous gap in our knowledge of the neuropathologic changes associated with normal senility was filled by an exhaustive study published by Gellerstedt [15] in 1933.

While the lesions associated with senile conditions are well known, it is still an unsolved problem why senile psychoses occur in some old persons but not in others. Therefore it seems worth while to review the subject in an attempt to determine whether certain newly developed ideas and methods of approach may throw light on the problem. These new viewpoints are von Braunmühl's [16] theory that the lesions are manifestations of colloidal alterations of the tissues, the conception that senile changes represent a type of tissue reaction that is etiologically nonspecific, and the possibility

that alterations of the blood-cerebrospinal fluid barrier may be of pathogenetic significance.

The theory of von Braunmühl [16] that aging consists essentially in an increasing aggregation of colloidal particles and the conception of senile lesions as a general type of tissue reaction have been discussed in earlier papers.[3, 4] These views are not contradictory, for just as the colloidal changes that take place in nonliving systems with aging can also be produced by various physical and chemical agents, so too the histopathologic aging process in man can be produced by different abnormal influences. The conclusion was expressed [3] that the process of aging may be modified by different factors, with the latter actually responsible for the development of the different disorders in which senile lesions appear. A search for such abnormal influences in senile psychoses has been undertaken in the present study.

The question whether alterations of the blood-cerebrospinal fluid barrier may be a pathogenetic factor in senile dementia is of interest because certain authors, of whom Gellerstedt [15] is the most recent, have suggested that circulatory disturbances may play a rôle in the production of the cerebral changes found in senile conditions. It has therefore seemed advisable to devote special attention to the vascular system and choroid plexus. In some of the cases the permeability of the blood-cerebrospinal fluid barrier was investigated by means of Walter's bromide method and an attempt will be made to correlate the results with the data disclosed by pathologic examination.

Material.

The work reported here is based on a detailed study of 24 cases of senile psychoses. There were five male and 19 female patients, whose ages varied from 66 to 100 years at the time of death (Table 1). As control material the following group was used: A 55-year-old manic patient who died from lobar pneumonia after an illness lasting six days and whose brain failed to show abnormal changes; five patients with psychoses with cerebral arteriosclerosis whose ages ranged from 68 to 86 years and two with symptomatic psychoses who died at the age of 68. This group received the same detailed examination that was performed in the cases of senile psychoses. In addition, the brains of 42 patients with miscellaneous mental disorders were used as controls for a study of senile plaques. The ages of these patients varied from 55 to 78 years.

TABLE 1

SUMMARY OF DATA ON 24 PATIENTS WITH SENILE PSYCHOSES.

Case no.	Age at death.	Heart weight, grams.	Brain weight, grams.	Vascular changes.* Small meningeal vessels.	Vascular changes.* Cortical vessels.	Vascular changes.* Focal lesions.	Vascular changes.* Choroid plexus.	Cortical changes.* Nonspecific cell changes.	Cortical changes.* Senile plaques.	Cortical changes.* Neurofibril changes.	Cortical changes.* Intellectual deterioration.*	Remarks.
1	66	330	1140	2	3	0	3	2	3	1	1	Cancer of uterus, marked affective features.
2	67	225	1355	3	2	1	3	2	4	3	3	Pelvic cellulitis.
3	70	220	1120	3	2	2	3	2	2	4	1	Affective features
4	72	340	1360	3	3	1	3	2	4	2	1	Marked paranoid features.
5	72	250	1200	2	2	1	3	3	2	2	3	
6	73	315	1220	4	2	3	2	2	2	0	3	Terminal cellulitis.
7	73	415	1135	3	1	1	2	2	2	1	1	Affective features.
8	74	230	1350	2	2	0	1	3	1	0	1	
9	77	375	1250	3	3	1	3	2	4	2	3	Marked paranoid features.
10	78	360	1140	2	1	0	3	3	4	4	3	
11	78	425	1425	3	3	0	3	3	3	1	2	Cancer of rectum, marked paranoid features.
12	79	220	1000	2	2	0	3	3	3	3	3	
13	79	250	1250	3	2	0	3	1	4	1	3	
14	80	225	1200	2	1	0	3	1	2	2	3	
15	80	345	1180	3	2	1	..	4	3	2	4	Marked paranoid features.
16	80	275	1090	2	3	1	4	1	3	1	2	
17	81	350	1175	2	3	0	3	4	1	4	3	Paranoid features.
18	81	260	1070	2	2	3	2	3	4	4	3	Suppurative parotitis.
19	81	365	1050	4	3	3	2	3	4	1	3	Paranoid and affective features.
20	83	210	....	2	4	0	3	3	4	4	4	
21	84	255	865	3	2	3	3	4	4	1	4	
22	87	330	1150	3	3	0	2	4	3	1	2	Slight paranoid features.
23	89	275	910	2	1	1	2	4	2	1	3	
24	100	125	1030	1	2	1	3	3	2	1	4	Cancer of ovary.

* The degree of involvement is represented by numbers with 0 indicating an absence of involvement. Slight or very slight changes are indicated by 1, and moderate, severe and very severe changes are represented by 2, 3 and 4, respectively.

General Somatic Changes.

The work of Lewis [17] and Freeman [18] has shown that a study of the pathologic changes occurring in parts of the body other than the brain may yield information of value to psychiatry. According to their observations, certain types of somatic reaction are associated with definite types of psychologic reaction. As expressed by White,[19] a psychosis such as dementia precox is noncompensatory at the psychologic level in the sense that the patient usually succumbs to the stresses that bring about his psychosis and deteriorates; such a psychosis occurs in a person of noncompensatory type at the somatic level. On the other hand, paranoid and cycloid reactions, which are regarded as compensatory psychoses inasmuch as they present evidence of compensatory mental mechanisms, are found in persons with a capacity for developing compensatory bodily reactions. The question arises whether an examination from this point of view may contribute to our knowledge of senile psychoses. Detailed microscopic observations were not made, but certain outstanding features seem worthy of discussion.

It is well known that senile dementia is associated with general atrophic changes throughout the body. This would no doubt be classed as a decompensating type of reaction. Conditions such as hyperplastic reactions of the circulatory system and carcinomatous growths are conspicuous examples of compensatory somatic processes. It was therefore interesting to note that in the whole series of cases the average weight of the heart was 290 gm., a figure which approximates the weight of the normal heart. According to data given by Lewis,[17] dementia precox and general paresis are the only mental disorders in which lower average heart weights occur. The figures varied from 125 to 425 gm., being below 250 gm. in seven cases, between 250 and 300 gm. in six cases and above 300 gm. in 11 cases (Table 1). Thickening of the valves was present in 10 cases. Some degree of coronary sclerosis was noted in all but one case, and only two patients failed to show sclerosis of the aorta. Three patients had carcinomatous growths. Lewis [20] has pointed out that biologically "good" lungs are characteristic of the compensatory reaction types. Apart from the occasional occurrence of bronchitis, chronic disease of the lungs was not observed, but terminal conditions were frequently noted. Hypostatic congestion was

found in five cases, bronchopneumonia in six cases and lobar pneumonia in four cases. In three cases the immediate cause of death was an acute infection of the subcutaneous tissues.

The atheromatous changes were as a rule mild or moderate in severity, yet their frequency, combined with the common lack of cardiac hypertrophy, suggests a weak compensatory capacity in the group as a whole. At the same time, a certain number of patients showed compensatory somatic reactions, though they were not as excessive as one sees in some conditions. Interestingly enough, almost all of these patients displayed evidence in their psychosis of compensatory mental reactions, such as well developed delusional formations or pronounced affective features. Thus in case 11 (Table 1) the patient presented on the somatic side the largest heart of any in the group, chronic valvular heart disease, severe arteriosclerosis and a carcinoma of the rectum; on the psychologic side the patient showed an outspoken paranoid type of senile psychosis. Pronounced paranoid reactions also occurred in cases 4, 9, 15, 17 and 19. In these the heart weights were well above the average (Table 1), and while there was valvular heart disease, it was not more marked than that noted in some of the patients with small hearts. One patient (case 1) with a slightly hypertrophied heart and a carcinoma of the uterus showed marked affective features in her psychosis. The third patient with carcinoma was a woman, aged 100, who otherwise exhibited no evidence of compensatory reactions. The fact that the patient was able to reach such an advanced age indicates that she possessed biologically "good" tissues, though she finally developed a psychosis characterized by gradually increasing intellectual deterioration and little else. A more conspicuous exception to this correlation between somatic and psychologic reactions was seen in case 3, in which the patient presented manic features without any evidence of compensatory tissue changes. In another patient (case 10) moderate cardiac enlargement was observed in the absence of outspoken mental reactions of a compensatory type. On the whole, however, the correlation was striking enough to suggest that it was of significance in spite of the rather small group of cases studied.

Gross Neuropathologic Changes.

Macroscopic examination of the brain did not as a rule reveal striking changes. The dura was frequently adherent, and slight

opacity of the pia-arachnoid, particularly in the frontal region, was not uncommon. Cerebral atrophy was pronounced in several instances but was more often mild or moderate in degree; its presence could not be demonstrated with certainty in all cases. The cortical atrophy was usually more noticeable in the anterior frontal region than elsewhere, though the temporal or parietal lobes occasionally showed a tendency to circumscribed involvement. Outspoken atrophy confined to one lobe was not observed. The brain weights, which were available in 23 cases, varied from 865 gm. to 1425 gm. (Table 1). The average for the group was 1159 gm. This is smaller than the average figures for young or middle aged groups, but it does not differ appreciably from the average weights given by Wertham [21] and Gellerstedt [15] for normal persons of advanced age.

In all cases the vessels at the base of the brain or their larger branches showed arteriosclerosis. The changes were described as very slight in five cases, moderate in extent in 11 cases and severe in eight cases. There was, with occasional exceptions, a fairly close parellelism between the cerebral and the general somatic atheromatous lesions. Cerebral softenings were noted in five brains, of which two had large and three had small single foci.

Microscopic Changes in the Brain.

Meningeal and Vascular Changes.—The pia-arachnoid showed a moderate increase of connective tissue in some places but not in others. Marked differences in the severity of the fibrosis did not occur in the different cases. An increase of fibroblasts and mesothelial cells was frequent and it was not uncommon to find a few widely scattered lymphocytes. More severe cellular reactions occasionally occurred and were probably secondary to neighboring tissue changes or to complicating toxic conditions.

The small meningeal vessels regularly displayed adventitial thickening, which was pronounced in almost half of the group. In some cases a hyaline-like appearance was noted. The severest changes consisted of endothelial swelling and proliferation with hyaline-like thickening of the outer layers and narrowing of the lumen. The cortical vessels often showed moderate endothelial and fibroblastic proliferation and occasionally hyaline-like changes. The vessels of the white matter and basal ganglia presented similar but somewhat more marked alterations. Many of the perivascular spaces

were considerably dilated, especially in the white matter, where they not infrequently contained a few compound granular corpuscles. Small accumulations of lymphocytes were observed in the adventitial spaces on rare occasions, apparently representing a reaction to severe vascular disturbances. Regressive changes of the cells of the cortical capillaries and of the media of the larger vessels were not uncommon. The most marked involvement of this type occurred in the brain of the oldest patient. Atherosclerotic lesions of the larger vessels were often encountered, but the changes were not as a rule pronounced.

Focal lesions were observed in 14 cases. These consisted of small acellular areas (Verödungen), paled areas (Erbleichungen) and foci of softening. As a rule they were not numerous, only four cases presenting involvement which was severe enough to occupy a prominent place in the pathologic picture. There was a close correlation between the occurrence of focal lesions and the intensity of the alterations observed in the small meningeal vessels. Severe damage to the latter and severe atherosclerosis of the larger arteries usually occurred together, but the proliferative changes of the cortical vessels seemed largely independent of other vascular disturbances.

The choroid plexus was examined microscopically in 23 members of the group. In all cases it showed an increase of connective tissue, which took on a red color in the van Gieson stain. This occurred chiefly about the small and medium sized vessels. The increase was pronounced in 16 cases. In a few cases the cells of the choroidal villi appeared shrunken and atrophic. Deposits of calcareous-like substances were regularly observed.

Nonspecific Cell Changes in the Cerebral Cortex.—In all cases an examination of the cerebral cortex in alcohol-fixed sections disclosed widespread alterations of the nerve cells and a less extensive decrease in their number (Figs. 1 and 2). The commonest type of change was a condition characterized by paleness of the Nissl bodies, which were ill-defined and in the severe cases altered to a fine, faintly colored, dust-like material uniformily scattered throughout the cytoplasm. As a result, the cerebral cortex presented a washed-out appearance (Figs. 1 and 2). The smaller neurones appeared more vulnerable than the larger ones, but in several cases practically all were very pale. Cell shadows were common. While

it has been frequently stated that pigmentary degeneration of the nerve cells is characteristic of senile conditions, it was seldom a prominent feature in the group reported here. Chronic sclerosis of Nissl was occasionally observed in isolated cells, but was completely absent in many cases.

As a rule, the loss of cells was not pronounced and in a considerable number of cases a decrease could only be demonstrated by a careful comparison with the normal control material. Yet measurements made at a number of corresponding points in the anterior frontal region of 15 brains disclosed a slight but consistent narrowing of the cerebral cortex in all cases. The depth of the cortex from the outer margin of the first layer to the margin of the white matter was from 7.9 to 26.5 per cent less than that of the cortex of the brain used as a normal control, the average difference being 15.3 per cent.

Several cases were observed in which especially severe cell losses combined with considerable neuroglial proliferation produced outspoken disturbances of the cyto-architecture, but in most instances the alterations were not associated with any marked disarrangement of the cortical laminations (Figs. 1 and 2). While the changes were diffuse, they were usually most pronounced in the third layer of the cortex and were accentuated in certain parts of the brain. These areas did not correspond closely to the different architectural fields. Furthermore, marked variations in the intensity of the changes were common in neighboring areas. In many cases the anterior frontal region showed the greatest alterations but almost as frequently there was equally severe involvement of the frontal, temporal and parietal lobes. As a rule, the mildest disturbances occurred in the precentral gyrus and the occipital lobe. The cornu ammonis, which has been widely regarded as particularly vulnerable to the senile disease process, exhibited the severest damage in only three cases.

Senile Plaques.—These structures occurred regularly in the cerebral cortex (Fig. 3). They were practically never lacking from any low power microscopic field. They were also found elsewhere in the brain but this will be discussed later. Their frequency of occurrence and their morphologic features are greatly influenced by the technical procedures used to demonstrate them. Silver stains are the usual methods employed. The Bielschowsky stain, which has

been the classical procedure, reveals them as spherical or oval argentophile masses located in the intercellular substance and composed of granular or amorphous material in which short fibrils of varying thickness may occur. Some plaques have a solid mass or "nucleus" in the center, around which there is a clear space or halo; this is in turn surrounded by a ring of amorphous or fibrillar argentophile material (Fig. 4). We have found, in agreement with the observations of Gellerstedt,[15] that the Bielschowsky stain frequently fails to demonstrate plaques satisfactorily. According to our observations, the Dieterle-Neumann modification[22] of the Hortega stain is a more reliable method (Fig. 3). It gives the best results with fresh material that has been fixed in the special solution recommended, though it can also be used on older formalin fixed tissue. In sections fixed in alcohol, plaques can be demonstrated by means of the Perdrau method as given by Wertham.[21] This method possesses the advantage of permitting a study of plaques in large sections that can be compared with adjacent sections stained by the Nissl method. However, none of the silver stains give constantly successful results and in doubtful cases particularly, several methods should be employed. The Nissl stain reveals a few plaques in a considerable number of cases, but the results are too inconsistent to be of any great value.

The plaques ranged in frequency from a lower limit of 10 to 25 per low power field (Zeiss obj. 8, num. ap. 0.2, ocul. x 10) in two cases to an upper limit of from 60 to 100 and even more per low power field in nine cases. In the latter it was often impossible to count the plaques because they seemed to merge with one another, producing a plaque-like infiltration of the tissues. In the individual case the lesions were usually most numerous in the areas showing the severest cell changes and cell losses. A few of the cases with a great abundance of plaques presented only moderate cell changes. Less often the latter were very pronounced in cases exhibiting small numbers of plaques (Table 1). The lesions occurred in all layers of the cortex and were not uncommon in the subcortical white matter. They were usually most abundant in the third cortical layer. They tended to accumulate in greatest numbers near the bottom of the sulci. Ring-like perivascular plaques were occasionally encountered. Plaques were often observed in the outer molecular zone of the gyrus dentatus. So far as the number of lesions was concerned,

the cornu ammonis and hippocampal gyrus were not as a rule more vulnerable than other parts of the cerebral cortex.

Lesions of the Intracellular Neurofibrils.—The nerve cells of the cerebral cortex showed neurofibril lesions of the Alzheimer type in all but two cases. The Bielschowsky method was the best stain for demonstrating them (Fig. 4), though the Dieterle-Neumann method [22] produced good results in some instances. They assumed different forms, among which the commonest were: thick strands outlining the cells, fish-hook forms, coils of thickened fibrils occupying smaller or larger parts of the interior of the cells (Fig. 4), and clumped masses of fibrils running along the side walls of the cells. The last mentioned type occurred chiefly in the cornu ammonis. In this area the lesions were occasionally seen in the Nissl stain as vaguely defined bands which were darker in color than the surrounding cell substance. The neurofibril lesions were observed with greatest frequency in Sommer's sector of the cornu ammonis and in the neighboring parts of the hippocampal gyrus. In six cases these areas were the only parts of the brain involved. The lesions were very scanty in number in five cases. They were abundantly distributed throughout the whole cerebral cortex in seven cases, five of which were classed as especially severe, with many high power microscopic fields containing two or three examples of the Alzheimer type of alteration. Even in these cases, however, the lesions were distributed irregularly and were often absent in several adjacent high power fields. As a rule the brains that presented an abundance of neurofibril changes also showed many senile plaques, but there were two cases in which many of the former lesions were associated with a small or moderate number of plaques (Table 1). In the cornu ammonis and hippocampal gyrus the large nerve cells were particularly vulnerable. Elsewhere the small and medium sized cells of the third and fifth cortical layers were chiefly affected. The alterations were confined to the cerebral cortex with the exception that a few typical neurofibril lesions were observed in the corpus Luysii in one case and in the gray matter about the third ventricle in another.

In four cases argentophile inclusions of the type associated with Pick's lobar atrophy were found in a small number of the nerve cells of the cornu ammonis. Typical examples of granulo-vacuolar

degeneration, described by Simchowicz [5] and others in cases of senile dementia, were encountered in one case only.

The White Matter.—The white matter of the cerebral hemispheres did not present striking changes, apart from the vascular lesions already described. In some cases a considerable number of small irregularly distributed lacunæ were observed (Fig. 2). Most of them apparently represented dilated perivascular spaces. Stains for demonstrating myelin sheaths were not used. According to Grünthal,[13] such stains do not reveal any characteristic changes in senile dementia, though occasionally there is a distinct loss of cortical fibers in regions which are otherwise severely damaged.

Neuroglial Changes.—A slight or moderate increase of macroglia cells was commonly observed in the cerebral cortex and white matter. Microglia cells were often found in the neighborhood of senile plaques, but an outspoken diffuse proliferation of these elements was not noted. Regressive neuroglial changes were encountered with considerable frequency, yet in many cases they were not a prominent feature. Marginal gliosis was usually observed, and as Gellerstedt [15] has pointed out, surfaces presenting sharp angles and sudden changes of direction were especially vulnerable. Noteworthy alterations of the oligodendroglia were not detected, though special stains for their demonstration were not used. On the whole, the neuroglial elements showed a striking lack of reaction to the severe changes encountered (Figs. 1, 2 and 5).

Changes in Other Parts of the Brain.—As a rule, the putamen and caudate nucleus showed changes of the nerve cells similar to those observed in the cerebral cortex. In six cases the impression was obtained that there was a slight but definite paucity of small nerve cells. Foci of softening were not more frequent here than elsewhere. A mild or moderate increase of neuroglia cells was common. Senile plaques occurred in all but two of 20 cases in which tissues were available for study. This corroborates the observations of Boumann and Bok [23] regarding the frequency of occurrence of plaques in these areas. The number ranged from 5 to 20 per low power field in most cases, though figures above as well as below these limits were occasionally obtained.

The globus pallidus was free of plaques with the exception of one case in which it presented a few widely scattered lesions. The nucleus amygdalæ, which is said to be especially vulnerable to

senile plaques and neurofibril changes, was not investigated. The thalamus and the gray matter about the third ventricle were examined in 10 cases, the former showing a small number of plaques in five cases and the latter in four cases. The substantia nigra regularly exhibited a few plaques in five cases that were studied; the red nucleus was also slightly involved in two members of this group. All but one of seven cases in which the midbrain was examined had a scanty number of the lesions in the gray matter about the aqueduct of Sylvius. With respect to the appearance of these subcortical ganglia in Nissl stains, the changes are difficult to interpret and it was not possible to demonstrate clearly that pronounced disturbances had occurred. Increased lipoid deposits in the nerve cells of the pallidum and thalamus were frequently observed and in a few cases some of the nerve cells of the substantia nigra showed degenerative changes with loss of pigment.

Only minor changes were observed in the cerebellum. The Purkinje cells were frequently pale. There were vascular alterations of the type described in the cerebral hemispheres. A slight paucity of Purkinje cells, particularly at the summits of the peripherally situated lobules, was noted in 14 cases, but it is questionable whether the losses were sufficient to be of definite significance. In three cases the molecular layer presented a few widely scattered senile plaques. A moderate increase of neuroglial cells was common. The nerve cells of the dentate nucleus often contained considerable amounts of lipoid.

Deposits of Fat, Iron and Other Substances.—While an increase of lipoid occurred in practically all cases, it was not always pronounced and it did not bear any definite relation to other types of involvement or to the age of the patients. The lipoid accumulated chiefly in the nerve cells, but was often present in neuroglia cells and in the walls of the small cortical vessels. In agreement with the observations of Gellerstedt,[15] it was found that the most vulnerable areas were the end plate and so-called resistant portion of the cornu ammonis, which seldom showed senile plaques or neurofibril lesions.

The iron content of the brain, as disclosed by the Turnbull blue reaction, was slightly increased in most of the cases. However, the increase was rarely sufficient to be considered of definite significance. In several cases senile plaques located in the outer molecu-

lar zone of the gyrus dentatus were apparently composed of calcareous-like material which contained iron. Occasionally a few nerve cells showed a diffuse blue color which was most pronounced along the course of thickened fibrils. This was noted chiefly in Sommer's sector of the cornu ammonis.

Corpora amylacea were encountered in practicaly all cases, and calcareous-like material was frequently found in the walls of the vessels located in the globus pallidus, putamen, dentate nucleus and white matter of the cornu ammonis. These deposits showed no apparent relation to other types of involvement and it is questionable whether they were of any significance.

The Significance of Vascular Factors and Disturbances of the Blood-Cerebrospinal Fluid Barrier.

The alterations of the cerebral blood vessels and choroid plexus did not bear any direct or constant relation to the changes typical of senile psychoses. Furthermore, the control observations clearly indicated that similar vascular alterations may occur in a great variety of conditions. The focal lesions in the brain were a minor element of the pathologic picture in all but four cases. The proliferative alterations of the cortical vessels, which resembled productive forms of endarteritis frequently associated with toxic states, were least marked in two patients (cases 7 and 10, Table 1) who died suddenly without presenting evidence of toxic or wasting somatic disease. This suggests that the lesions in question may largely represent a reaction to such somatic conditions.

Thus an analysis of the anatomic observations tends to eliminate vascular changes as a significant factor in the origin of the parenchymal lesions. At the same time, it is well known that estimating functional capacity from anatomic study is an uncertain procedure. It is still possible that disturbances of function of the hematoencephalic barrier may play an important pathogenetic rôle. The question arises whether the Walter bromide test will throw any light on the problem, though it should be pointed out that the passage of bromide into the cerebrospinal fluid is not necessarily a measure of the passage of this or other substances from the cerebral vessels to the nervous tissue. The distribution ratio of bromide between blood

and cerebrospinal fluid was determined in nine cases of senile psychoses and in three of the control cases. While the number of cases is not large enough to warrant definite conclusions, certain general impressions of value may perhaps be obtained. The results are presented in the following table, in which the degree of vascular damage ranging from mild to very severe is indicated by the number of plus signs from 1 to 4, with 0 representing an absence of involvement.

			Vascular alterations.				
Case No.	Diagnosis.	Distribution ratio of bromide.	Large meningeal vessels.	Small meningeal vessels.	Cortical vessels.	Choroid plexus.	Focal lesions.
25	Cerebral arteriosclerosis.	1.96	+++	++++	++	+++	+++
6	Senile psychosis	2.10	+++	++++	++	++	+++
19	Senile psychosis	2.33	+++	++++	+++	++	+++
18	Senile psychosis	2.40	++	++	++	++	+++
26	Toxic psychosis	2.64	0	+++	+++	Not available	+++
27	Cerebral arteriosclerosis.	2.72	+++	++++	++	+++	++++
7	Senile psychosis	2.72	++	+++	+	++	+
10	Senile psychosis	2.77	++	++	+	+++	0
9	Senile psychosis	2.80	+++	+++	+++	+++	+
1	Senile Psychosis	2.83	++	++	+++	+++	0
12	Senile psychosis	310	+	++	++	+++	0
5	Senile psychosis	3.37	+++	++	++	+++	+

It is of course realized that quantitative estimations of pathologic alterations are at best only approximate. Focal lesions, which showed the closest relation to changes of the small meningeal vessels, perhaps serve as the most accurate measure of the severity of the vascular involvement. It should also be remembered that the distribution ratios of bromide were not determined immediately prior to death and hence did not necessarily represent the terminal state of affairs. In spite of these difficulties, it was interesting to note that most of the ratios below 2.80, that is, those indicative of any increased permeability to bromide, occurred in patients with

numerous small focal lesions. The patients in whom such involvement was less pronounced were more apt to have normal ratios. There was no relation between the ratios and the other neuropathologic alterations. In view of the nature of the bromide test [24] one might expect it to reflect the condition of the choroid plexus, but in the present series of cases it failed to do so. This has interesting implications with respect to the test, but a discussion of the subject is beyond the scope of the present paper.

The foregoing observations tend to suggest that the bromide test is of some practical value in determining the presence or absence of severe involvement of the small meningeal vessels, although it fails to throw light on the condition of the choroid plexus or cortical vessels. Naturally these results need confirmation in a larger number of cases. So far as our present methods of study indicate, however, vascular changes and alterations of the permeability of the barrier bear no causal relationship to the parenchymal disturbances typically associated with senile psychoses.

The Influence of Somatic Disease and Aging.

A scrutiny of the senile group failed to disclose any correlation between the various somatic diseases encountered and the parenchymal lesions in the brain. Furthermore, there was no parallelism between the severity of the latter and the ages of the patients. Thus the brain of the 100 year old patient showed much fewer plaques and neurofibril lesions than the brains of some of the patients in the sixties and seventies.

These observations were compared with the results of a study of 50 cases which were used as controls. The group included 15 patients with psychoses with cerebral arteriosclerosis, 10 with affective psychoses, seven with schizophrenia, five with symptomatic psychoses, five with alcoholic disorders, and a smaller number of patients with other types of mental illness. A great variety of toxic and wasting diseases were encountered in the group. In most of the cases only senile plaques were studied, since these structures represent the most striking lesion associated with senile dementia and at the same time can be evaluated quantitatively with a fair degree of accuracy. They were found in 25 members of the group.

There was an increasing tendency for plaques to occur with advancing age, as can be seen in the following table:

	Age groups.					
	55-59	60-64	65-69	70-74	75-79	80-86
Number of cases	10	15	9	6	9	1
Number of cases with plaques	2	6	5	4	7	1

The consistency of this tendency was especially striking in view of the composite nature of the material and strongly suggests that increasing age is an important factor in the origin of senile plaques. On the other hand, the observations failed to reveal any consistent correlation between different types of somatic disease and the occurrence of plaques.

Of the 25 cases with plaques, 12 showed only a scanty number of lesions. In five cases the number approached but did not equal that found in the senile group. Among the remaining cases, which presented involvement similar to that observed in senile brains with mild or moderately severe alterations, there were three patients with cerebral arteriosclerosis, aged 69, 77 and 79, two with affective psychoses aged 66 and 78, one with alcoholic deterioration, aged 75, one with a symptomatic psychosis, aged 63 and one with schizophrenia, aged 58. The last mentioned patient died suddenly of acute cardiac failure and failed to present outstanding somatic disease, apart from fatty degenerative changes of the heart muscle. In the case of symptomatic psychosis a chronic septic process had been present for many years. Neither of these patients displayed any mental symptoms pointing to a senile psychosis. In this connection a previously reported case [3] may be recalled in which plaques were associated with a toxic disorder.

At the same time, it could not be demonstrated that plaques occurred more frequently in certain psychoses than in others, though it is possible that examination of a larger group might disclose such a tendency. At any rate, some of the foregoing observations suggest that increasing age in itself may not be the sole factor in the development of the lesions, and there are additional features pointing in the same direction. Thus plaques failed to occur in the brains of two patients, aged 77 and 78, and the oldest patient in the control group, a woman, aged 86, who was suffering from cerebral arteriosclerosis, had only a scanty number of plaques in the brain. It may

also be recalled that Malamud and Lowenberg [25] observed many plaques and neurofibril lesions in the brain of a 24-year-old patient. Other examples illustrating the occurrence of these alterations in comparatively young persons have been mentioned in earlier communications.[3, 4]

The apparent contradiction between the observations in the group as a whole and those in individual cases may perhaps be explained as follows. With advancing age the brain shows an increasing tendency to the formation of plaques, but there may be other factors concerned in their origin and these factors, though still unknown, are largely independent of age and may well differ from case to case. This is in line with the theory that senile plaques may be a manifestation of the aging process on the one hand and may represent a general type of tissue reaction on the other.

Diagnostic Considerations.

It is evident that the histologic changes found in senile psychoses may be encountered in a great variety of conditions. The work of Gellerstedt [15] particularly has shown that the complete neuropathologic picture of senile dementia occurs with great frequency in association with normal senility. It is of course well known that Alzheimer's disease and senile psychoses present similar changes. The chief difference, as pointed out previously,[4] is that the alterations are more pronounced, especially with respect to neurofibril lesions, in Alzheimer's disease and the neuroglial reaction is usually much stronger in the latter than in senile dementia (Fig. 5). There are occasional instances in which it would not be possible to differentiate the two conditions from each other on purely anatomic grounds. In such cases clinical differences, which have been discussed elsewhere,[3, 4] would be of paramount importance. If one were obliged to choose the single feature most characteristic of senile psychoses one would be inclined to select the senile plaques.* Von Braunmühl [16] has claimed, largely on theoretical grounds, that these le-

* It has been proposed by Wertham [21] that these structures should be called "argentophile" instead of "senile" plaques since they may occur in non-senile conditions. However, the older term is well established in the literature and it cannot be denied that in the great majority of cases in which plaques are found the patients have reached an age consistent with the senile period of life.

sions may be entirely lacking in cases of senile dementia. Yet the statement of Grünthal [13] that the complete absence of plaques has not been satisfactorily demonstrated in cases that were adequately studied clinically and pathologically is still valid. One may say that senile dementia is associated with a characteristic pathologic picture, but it is necessary to add that the latter is by no means specific of that disorder. To neglect the clinical symptoms would obviously lead to gross errors in diagnosis.

It is not the object of this paper to discuss diagnostic difficulties in clinical fields. The observations made in the course of the present study were in agreement with the well known fact that mistakes in differentiating between senile psychoses and psychoses associated with cerebral vascular disturbances are common. The diagnostic difficulties are rendered more pronounced by reason of the frequent occurrence of arteriosclerotic and senile changes in the same brain. However, equally severe vascular and senile alterations were seldom found together; as a rule one or the other type of condition predominated greatly in any given case. A reliable anatomic differentiation between the two conditions can often be made only by means of microscopic studies. Thus in two cases of cerebral arteriosclerosis belonging to the control group the large meningeal vessels showed little evidence of alterations and macroscopic softenings were not observed, but microscopic examination disclosed severe involvement of the small meningeal and cerebral vessels with numerous acellular areas (Verödungen) and foci of softening.

One point of interest was that in the senile group as a whole the circulatory system showed little tendency to develop strong compensatory reactions, as indicated especially by the size of the heart. The impression has been gained that the tendency to develop such reactions is much more pronounced in patients with cerebral arteriosclerosis.

Correlation of Clinical and Pathologic Features.

The diffuse distribution of the neuropathologic changes renders it difficult if not impossible to correlate individual symptoms with histologic observations. The early attempts of Fischer [6] to base par-

ticular types of senile psychosis on particular anatomic lesions were unsuccessful, and it is now generally believed that such a relationship does not exist.

One feature commonly found in senile patients, muscular hypertonicity, might perhaps be mentioned. The impression was obtained that this was probably based on involvement of the basal ganglia, particularly the putamen and caudate nucleus, which were frequently affected.

In view of the fact that one would expect destructive lesions of the brain to lead to loss of function, the degree of involvement and the severity of the intellectual defect were compared in each case. The data are presented in Table 1. None of the individual components of the pathologic picture showed any striking quantitative relationship to the intellectual impairment, though the senile plaques showed a greater tendency to such a correlation than the other lesions. An attempt was made to estimate the severity of the histologic alterations as a whole, and it was found that severe intellectual impairment was apt to occur in cases showing extensive involvement. However, this parellelism was neither close or constant. There were enough exceptions to make one reject the idea that there could be any simple and direct quantitative relationship between clinical and pathologic changes.

For example, in case 4 (Table 1), a patient with a paranoid type of senile psychosis, there was only a minimal amount of intellectual impairment though the changes in the brain, particularly with respect to plaques, were very extensive. In other words, the positive symptoms, that is those representing the actual reactions and activities of the patient, were in the foreground. They consisted of a fairly well elaborated delusional system with appropriate behavior thereto, and as such represented attempts at psychologic compensation. It was, therefore, interesting to note that the patient also presented evidence of somatic compensatory phenomena in the circulatory system. In some of the other cases presenting evidence of strong psychologic compensatory attempts, as indicated by outspoken paranoid or affective features, a similar though less striking inconsistency between neuropathologic changes and intellectual deterioration was also observed (Table 1). There were some cases too in which severe loss of mental function was associated with only moderate cerebral involvement.

The inconsistency between clinical and neuropathologic phenomena in the field of senile conditions has long been noted. It has been rendered still more striking by the recent work of Gellerstedt,[15] who showed that quantitatively as well as qualitatively the pathologic picture of senile dementia frequently occurs in association with normal senility. Von Braunmühl [16] has attempted to explain the discrepancy by his theory that most so-called senile lesions are secondary phenomena of colloidal changes and, therefore, do not necessarily reflect the real extent of the fundamental tissue alterations. Thus it is possible to say that the brain of a senile patient is more severely damaged than that of an old person of normal mentality, even though the demonstrable alterations may be the same in both cases. According to von Braunmühl's conception, however, one can assert with equal justification that the brain of a mentally normal person is altered more profoundly than the brains of severely demented patients. This theory, which postulates undemonstrable changes in the brain, is effective only if it is applied in one direction, a direction determined by preconceived ideas as to what the tissue damage should be. Therefore, it cannot be accepted as a satisfactory explanation of the troublesome discrepancies between clinical and pathologic data.

A Consideration of the Pathologic Changes From the Point of View of the Whole Person.

Although the current views on the nature and origin of senile lesions have been useful in accounting for some of the observations, we are still faced with the striking inconsistencies discussed in the preceding paragraphs. Furthermore, a search for a hypothetical factor or factors modifying the normal aging process and leading to the development of a senile psychosis has proved unproductive. There has been no evidence in support of the suggestion made previously [3] that toxic influences might play a rôle here. Attention has been focused on possible physical factors and on the cerebral changes but without success.

This suggests that the whole method of approach to the problem may be at fault and that we should look elsewhere for an explanation. A consideration of the person in whom the lesions are occurring may provide a solution of the problem. If the example (case

4), mentioned in the foregoing section, is scrutinized from this viewpoint, the possibility at once arises that the lack of pronounced intellectual deterioration in the face of extensive cerebral involvement was an expression of the unusually strong compensatory capacity of the patient, a capacity which was noted in somatic as well as in psychic fields.

The occurrence of senile lesions in the brains of persons who fail to show clinical abnormalities no longer seems puzzling when approached from this angle. Evidently such persons are able to compensate for the changes so well that a clinically recognizable disorder fails to develop. It is well known in general medicine that the different organs have a large fund of reserve power. To mention only a few examples, the kidneys, lungs and heart may suffer considerable damage and yet continue to perform their customary functions efficiently. It does not seem far fetched to presume that such an important organ as the brain possesses similar potentialities.

Of course, it is not denied that there is a quantitative aspect to the problem, yet so far as the evidence now available goes, the extent of the damage in senile psychoses is often no greater than that associated with the normal senium. Furthermore, within the senile group itself there is no simple quantitative relationship between pathologic and clinical changes. It is probable that if the damage to the brain were severe enough, it would completely overwhelm any organism, but the observations suggest that the senile patient is not as a rule completely overwhelmed. One can see defensive mechanisms at work, the significance of which as attempts to adjust should be given full consideration. Quantitative differences alone, in most cases at any rate, do not determine whether an old person is or is not going to develop a senile psychosis. This is in accord with the conclusions reached by Grünthal [13] and Critchley.[14]

In the light of the conception advocated here the pathologic changes no longer appear as the sole determining factor or even necessarily as the most important factor in the occurrence of a senile psychosis. The person's capacity to compensate for a certain amount of tissue damage becomes of immediate importance. This may represent the unknown factor that determines the occurrence of a senile psychosis. Depending on this capacity, one person with senile changes in the brain may show no clinical abnormalities, another may develop a psychosis which shows little evidence of com-

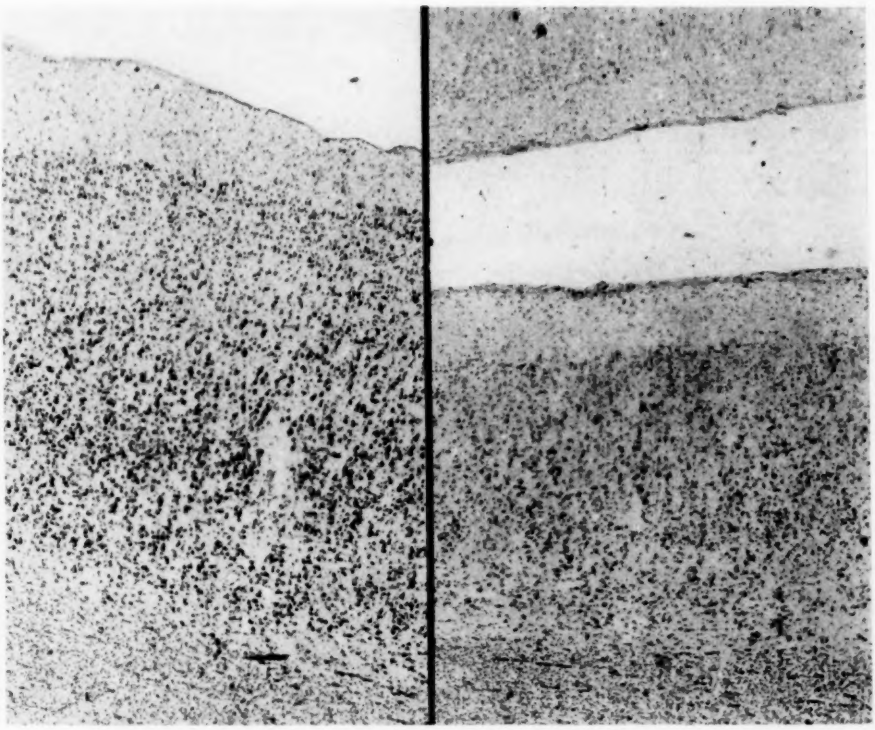

FIG. 1.—The section on the left is from the anterior frontal region of the brain used as a normal control. The section on the right is from the corresponding region of a senile brain (case 21) showing unusually severe shrinkage of the cerebral cortex. The cortex presents a washed out appearance. The nerve cells are pale and diffusely diminished in number, but a vigorous neuroglial reaction is lacking. Thionin stain; × 35.

FIG. 2.—Section from the anterior frontal region of a senile brain (case 18) showing less pronounced shrinkage and loss of cells than that illustrated in Fig. 1. The cyto-architecture is not grossly disturbed. This section presents alterations of average severity for the senile group. The lacunæ in the white matter in the lower part of the figure are probably dilated perivascular spaces. Thionin stain; × 35.

FIG. 3.

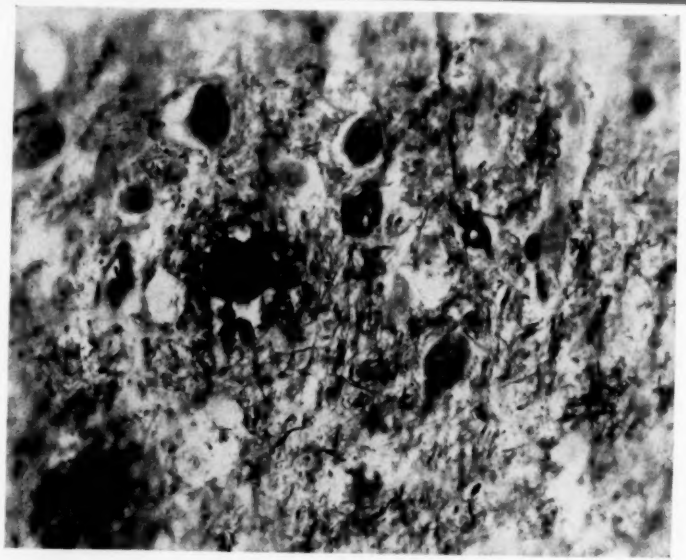

FIG. 4.

FIG. 4.—Section from the cerebral cortex of a senile brain (case 20) showing neurofibril lesions of the Alzheimer type in two nerve cells near the center of the figure. To the left is a senile plaque with a large "nucleus" and a similar plaque is seen in the lower left-hand corner. Near the left-hand margin of the figure a third nerve cell not completely in focus shows thickening and clumping of the neurofibrils characteristic of the Alzheimer type of change. Bielschowsky stain; × 500.

FIG. 3.—Section from the cerebral cortex of a senile brain (case 2) showing many senile plaques, which appear as rounded darkly stained areas. Dieterle-Neumann modification of the Hortega stain; × 30.

FIG. 5.—Comparison of the macroglial reaction in Alzheimer's disease and senile dementia. In the section on the left, which is from the cerebral cortex of a patient with Alzheimer's disease, there are many large astrocytes arranged about the periphery of two senile plaques that appear as vaguely defined masses in the center of the section. The section on the right is from the cerebral cortex of a senile brain (case 3). A faintly stained plaque is seen in the center of the figure but only a few astrocytes can be observed. Cajal's gold sublimate stain.

pensatory mechanisms and between the two extremes, all gradations will be observed. Herein may lie the explanation for the various clinical types into which senile psychoses have been subdivided. The impression has been gained that the compensatory mental reactions of the senile group as a whole, in harmony with the somatic reactions, are not strong. The weak neuroglial reaction may perhaps be a neuropathologic expression of the same condition.

The following case may be mentioned very briefly as an example of a senile psychosis with pronounced decompensating features:

CASE 14.—E. F., a married woman, aged 80, was admitted to the Foxborough State Hospital on January 3, 1934. Her health had always been excellent and apart from friction with her husband because of his alcoholic habits, there was nothing of note in her personal history. In recent years there had been increasing financial difficulties and in August, 1933, the patient was obliged to sell her house, which had been left to her by her father and in which she had lived all her life. Her husband was sent to the town infirmary and the patient stayed with relatives. She became very much upset over the breaking up of her home. Previous to that she had appeared much younger than her actual age. She seemed "to go to pieces" rapidly. She was unable to understand why she had to leave her home. Her memory became very poor and she became feeble physically, falling on a number of occasions. She failed to recognize her relatives and grew very irritable, showing an obvious dislike for her new surroundings. She became somewhat restless and shrieked a great deal, so that it was finally necessary to bring her to the hospital. On examination the patient showed marked impairment of memory, disorientation and an irritable and scolding attitude. There were slight compensatory attempts in that the patient once stated that she was young and had been recently married. On the whole, however, the picture was dominated by intellectual deterioration. The patient rapidly grew weaker, developed bronchopneumonia and died on March 3, 1934.

In this case the psychosis was sudden in onset and it progressed rapidly to a fatal termination. The neuropathologic changes were not severe in spite of the fact that there was profound impairment of memory. The feeble attempts at psychologic compensation were reflected on the somatic side in a circulatory system that showed practically no evidence of compensatory processes (Table 1).

The patient mentioned in the preceding section (case 4) was nearer the other extreme, with a well developed delusional system and only slight evidence of intellectual defect. The two cases described by Fünfgeld [26] belong here, though their significance for

the whole problem of senile psychoses was not discussed. Another case illustrating more pronounced compensatory attempts may be briefly cited:

CASE 9.—M. P., a woman, aged 75, was admitted to the Foxborough State Hospital on March 17, 1931. The patient had been married and divorced many years ago. She was capable and intelligent but of a suspicious nature. She had been able to support herself by doing hairdressing until three years prior to admission, when she developed a cataract in one eye. She had increasing financial difficulties and began to worry about what would happen to her in old age. An operation was performed on the eye but it was not successful. The patient then sold all her belongings and entered an old ladies' home in 1929. She soon began to show peculiarities of behavior. She became domineering, and attempted to look younger by bobbing her hair. She began to express delusions of persecution, thinking that the other women were in league against her, were trying to steal her belongings and were entering her room at night. She became increasingly irritable and aggressive in reaction to these ideas until it was necessary to commit her to the hospital. Examination disclosed a rather feeble woman, who presented a typical picture of a paranoid type of senile psychosis, with moderate intellectual impairment and a tendency to fabricate. The course of the illness was gradually progressive, with slowly increasing intellectual deterioration, physical enfeeblement and diminishing paranoid features. Death occurred on February 6, 1933, after an illness of about four years' duration.

In this case, as in the foregoing one, the onset of the psychosis seemed related to a difficult environmental situation, but in contrast to the previous example, the patient reacted to the situation by developing outspoken paranoid ideas, which represented compensatory psychologic mechanisms. On the somatic side too the circulatory system showed evidence of compensatory phenomena, and the neuropathologic changes were more pronounced than those encountered in case 14 (Table 1).

It is of course realized that these brief presentations leave many questions unanswered, but enough has been given to show that senile patients should be studied, not merely as anatomic specimens, but as living persons who are growing old and who are struggling to adjust to personal problems. The inability to meet such problems successfully may be the crucial factor that destroys or greatly impairs the person's compensatory capacity, upsetting an equilibrium which had hitherto been maintained and thereby leading to the development of a senile psychosis.

This conception is advanced as a working hypothesis that should be studied further and not as a fully established conclusion.* It emphasizes the importance of a study of the personal reactions of the senile patient. Psychologic aspects of old age have been largely neglected by scientific workers. Yet numerous questions came to mind. Why does the senile person live in the past? What is the person's reaction to the increasing limitations of physical and mental activities that occur with advancing years? What is the attitude toward approaching death? Here we must take into consideration powerful instinctive forces and it is well known that disturbances of such forces may profoundly influence the organism. But it is not the object of the present paper to discuss these questions. The object has been rather to point out that their investigation would be highly desirable in old persons who are normal mentally and in patients with senile psychoses.

At the same time, the impression should not be obtained that the pathologic changes are of no importance. Extensive changes are unquestionably present in cases of senile psychosis and are an essential part of the picture. But they are occurring in a living organism and it is necessary to ask, what is the person doing about them? The changes represent a handicap which may or may not be completely overcome. If a person breaks down in the face of this handicap, the reason may well lie in the person himself with his inherent and acquired traits and his own individual problems. This point of view is not new, it is in fact, the attitude of modern American psychiatry to mental disorders in general. It has merely been applied to a neglected subject in an attempt to show that the neuropathologic phenomena represent only one element in the whole picture and that a broader psychiatric study is needed to advance our knowledge of senile psychoses.

* It may perhaps be equally applicable to other organic psychoses though there is at least one difference to be reckoned with, namely, that many of the latter are regularly associated with outspoken exogenous factors which do not belong to the picture of senile dementia. Senescense appears to be an inevitable feature of increasing age in highly differentiated organisms, and if senile psychoses develop on such a foundation, as seems highly probable, the whole problem of senescense as a biologic phenomenon becomes a pertinent object of study. This aspect of the question has been touched upon in a communication written in collaboration with Kasanin [8] and cannot be discussed here.

SUMMARY.

The results of a pathologic study of 24 cases of senile psychoses are reported.

In all cases the cerebral cortex showed widespread nonspecific cell changes with less extensive but diffuse cell losses, an abundance of senile plaques and variable amounts of lipoid material. Neurofibril lesions of the Alzheimer type, usually in small or moderate numbers, occurred in all but two cases. The neuroglial reaction was as a rule weak. Involvement of the basal ganglia was common.

Proliferative alterations of the small cerebral vessels were regularly observed but were regarded as secondary or complicating features. Atherosclerotic changes were frequent, though in the great majority of instances they were not severe enough to occupy a prominent place in the pathologic picture.

A search for physical factors that might modify the normal aging process and be responsible for the development of a senile psychosis has proved unproductive.

There was a lack of correlation between the histologic changes and the degree of intellectual impairment. Attention was also called to the fact that equally severe alterations may be found in the brains of old persons of normal mentality.

These inconsistencies were attributed to differences in the capacity of different persons to compensate for the cerebral damage. The view is expressed that this capacity rather than the pathologic changes themselves is the determining factor in the origin of a senile psychosis.

A scrutiny of the senile group showed that strong compensatory mental reactions were usually associated with compensatory somatic processes.

The need of studying psychologic aspects of old age is emphasized, and the suggestion is advanced that the inability to meet personal problems may be the crucial factor that impairs the person's compensatory capacity, thereby leading to the development of a senile psychosis.

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DISCUSSION.

CHAIRMAN CAMPBELL.—The general principle of Dr. Rothschild's paper is extremely important. The contrasts between our viewpoint now and that of thirty years ago are striking.

Dr. Rothschild brings out the presence of certain structures, and wants to know what these structures mean when translated into dynamic terms, how far do these dynamic terms explain the real clinical problem, the way the person behaves and thinks. We have a shift of the focus of interest in our problem, which makes it a more living and interesting problem than it was thirty years ago.

I am sure there are other members here who will help us to translate these structures into dynamic terms, or show us the relation of these terms to the personality disorder which our patient presents.

DR. WILLIAM MALAMUD (Iowa City, Iowa).—I was interested in the stimulating thoughts that Dr. Rothschild expressed in his paper. The findings brought before us by the essayist are of interest both histologically and psychologically.

I wish to emphasize particularly the point Dr. Rothschild made that in thinking of any psychosis, organic, or functional, we have to consider the soma as well as the psyche. The one cannot explain the whole thing without taking into consideration the other.

The interesting development within recent years of looking upon a symptom, not as a sign of destruction, but as a sign of attempted adjustment, is, of course, the outstanding feature of the paper.

I should like to carry it just a little farther than Dr. Rothschild along the following lines: He feels that the lack of correlation between the degree of severity of the organic lesion and that of the disturbance in function in some cases may be due to the fact that mentally the person, instead of attempting to compensate, is giving up the fight and, so to speak, surrenders to the process.

I wonder if we cannot in addition to this say that even the organic features themselves, *i. e.*, the development of neuroglial or vascular reactions constitute signs of compensation against the destruction of the body which age brings with it. Thus the very lack of reaction may in itself be responsible for the severity of the symptoms.

I hope Dr. Rothschild will discuss further the differentiation between the senile psychoses and the Alzheimer syndrome. Last year when Dr. Rothschild presented a paper on this subject, the opinion was expressed by some that there is no difference between them. I wonder if Dr. Rothschild has studied the general reactions in the brain and whether he has found in them definite criteria, such as tissue reactions, which can in some way help us to differentiate the reaction we find in Alzheimer's Disease from that we find in senile psychosis.

DR. CHARLES FITZPATRICK (Providence, R. I.).—I was interested in the question of the dividing line between the Alzheimer's group and what we ordinarily call the senile group. Is there a histopathological dividing line and a clinical dividing line?

I am also interested in the new conception Dr. Rothschild has advanced about the constitutional susceptibility in senile psychoses. I had not considered that particular angle myself. I thought it was a question of organic change and severity of organic change determining the severity of mental reaction.

Did Dr. Rothschild find any particular areas of susceptibility in particular cases? In one case was the frontal lobe excepted, or in another the parietal lobe or occipital lobe, or what not?

Are there any different levels? In some old people, do you see the basal nuclei, and in other people, the cortex?

I have in mind a particular instance, two brothers. One of them was a case of presbyophrenic senile psychosis, and the other, at the time we were able to observe, was a rapidly developing paralysis agitans. It seems to me in those two cases we have examples of vulnerability at a different level in individuals of the same family. I should like to know Dr. Rothschild's ideas about that.

Dr. Konstantin Lowenberg (Ann Arbor, Mich.).—There are different types of atrophy in senile dementia, the most impressive being the atrophy of frontal and temporal lobes. Another type is the generalized atrophy which is also common, and finally, there is a third type of atrophy restricted to the occipital lobe. On sections, numerous additional findings can be noted. There are, for example, cases with a very pronounced atrophy of the white matter and well preserved cortex or there may be a general atrophy associated with numerous small lesions which are not softenings but are areas of atrophy usually around the blood vessels. Weigert's method usually yields numerous findings. There is a pronounced demyelinization of the white matter, usually diffuse in type. Frequently findings are encountered which are similar to those in Alzheimer's Disease or even Pick's Disease.

The histology of senile dementia is by no means solved. If the histological picture is considered as a whole, many changes can be found which are absent in Alzheimer's or Pick's Disease. For example, the atrophy of the III layer is extremely frequent in Alzheimer's Disease and much less so in senile dementia. The amount of pigment is much larger in senile dementia, fiber changes are much more pronounced in Alzheimer's Disease. There are cases of senile dementia in which there are no senile plaques but very numerous fiber changes. It is possible that there is a biological relationship between Alzheimer's Disease and senile dementia. I have seen senile dementia in a father and Alzheimer's Disease in the son.

Dr. William J. Tiffany (Brentwood, N. Y.).—May I ask a question in relation to Dr. Rothschild's statement about the occasional case in which he has found the characteristic pathological changes in the cortex, plaques and intracellular neurofibril alterations, but where the clinical history indicated a lack of characteristic senile symptoms? May I ask him if he has ever found in the post mortem examination of the brain, the cortex in a typical senile psychosis with an absence of plaques? I think that is a rather important thing to consider.

Dr. Herbert R. Unsworth (New Orleans, La.).—It seems to me there must be, of necessity, some explanation as to why certain senile individuals develop psychoses, and others do not. Apparently the organic changes accompanying senility are the same in all the aged, and yet a great many of the aged do not develop psychoses.

It has been my experience and it is my suggestion, that the difference lies in the mental life history of the patient who has developed a psychosis in senility. I recall the medical history in some of the individuals concerned, and it was definitely stated that they had been unstable, at least in early life.

I should like to ask if in these individuals there has not been some psychotic or psychoneurotic reaction in early life?

Dr. David Rothschild (Foxborough State Hospital, Foxborough, Mass.).—First, to answer Dr. Unsworth's question, whether there were psy-

chotic reactions previously: No, there were not. These people were all clear-cut seniles, who had led previously normal lives free of psychotic reactions.

As to toxic factors or focal infections, it is possible that they may act as precipitating or accelerating influences in some cases. I have not been greatly impressed by such a possibility in this group of cases. As a matter of fact, I was struck by the fact that most of these patients had been extraordinarily healthy persons. Repeatedly in the histories it was stated that the patient had never had a day's illness prior to the onset of the mental disorder. Of course, study of a larger group is necessary to determine whether or not this is of any significance.

I agree that the difference between senile dementia and normal senility probably lies in the life history of the individuals. I suspect that differences in the reactions to old age may represent important psychopathological factors. What are the person's reactions to increasing disability, what are the reactions to approaching death? I cannot answer these questions, but I think that they should be studied.

The question regarding the absence of plaques in cases of senile psychosis is an interesting one. It was dealt with in the article. Dr. Lowenberg has had a large experience. I would like him to publish the cases in which he failed to observe plaques, because the literature does not contain reports of cases of that type which have been studied adequately clinically as well as pathologically. I agree with Grünthal and other workers that a complete absence of these lesions has not as yet been satisfactorily demonstrated in cases of senile psychosis.

I am pleased to note that the discussants have added much information to what I have been able to gather myself. Dr. Lowenberg has mentioned many of the differences between senile psychoses and Alzheimer's Disease. This problem seems to interest many workers. It has been discussed in earlier communications. All I wish to add here is that I look upon the pathologic differences as quantitative but not qualitative. In cases of Alzheimer's Disease the changes are almost always more extensive, particularly with respect to neurofibril lesions and the neuroglial reaction. The clinical differences are as a rule fairly marked, but this problem has also been dealt with elsewhere.

In the group reported here I did not encounter any cases with outstanding localized atrophy of the brain. In many cases the atrophy was diffuse but was accentuated in certain areas, chiefly in the frontal or parietal regions. The motor area and the occipital lobe usually presented the least involvement.

Dr. Fitzpatrick asks about the extent of involvement. I believe that in a senile psychosis we are dealing with a disease of the whole brain, probably of the whole nervous system, which affects the cerebral cortex most severely and involves to a lesser extent the lower centers. In this group of cases the changes always predominated in the cortex, but the basal ganglia usually showed a certain amount of damage. Whether cases which show only involvement of the basal ganglia belong in the senile group is a question which I am not prepared to answer at the present time.

With respect to Dr. Fitzpatrick's comments on constitutional predisposition, I would like to emphasize the viewpoint that one should consider not only constitutional predisposition, but psychological factors arising in everyday life. One should consider the whole person with his life history and his everyday experiences and his reactions to these experiences, especially in later life.

Dr. Malamud's suggestion that the lesions themselves represent compensatory phenomena is an interesting and plausible conception. It is an interesting addition to some of the ideas presented here.

Dr. Rubin emphasized the severity of the changes in the senile group, but I would like to point out that the same severe changes may occur in persons of normal mentality. This has been demonstrated by Gellerstedt, who found severe changes in the brains of many mentally normal persons, including two prominent scientists who had led productive lives to the end.

GENERAL SEMANTICS.*

Implications of Linguistic Revision for Theoretical and Clinical Neuro-Psychiatry.

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Abstract.—The object of this paper is to call attention to the linguistic problems involved in contemporary psychiatry, not only in regard to psychiatric theory and nosology but in therapy as well. Linguistic factors are shown to be important determinants of personality structure, and cognizance of them is essential to any general theory of values upon which the rational treatment of personality deviation depends. Several contemporary leaders of psychiatric thought, among them William A. White, C. Macfie Campbell, Adolf Meyer and John T. MacCurdy, have made tentative generalizations and suggestions in this field, but it has remained for Alfred Korzybski to make a systematic investigation and evolve a general theory with specific application in psychiatric and other fields, thus relating many previously isolated areas of scientific knowledge into a synthetic "unified field theory" of what may be called general anthropology. The salient points of his work, as presented in his latest book, *Science and Sanity*,[1] are here presented with some discussion of their implications. In a later publication practical applications and clinical results will be reported.

In no branch of medicine is there such astonishing variation in terminology, and therefore apparently of theory, as in contemporary psychiatry. To judge from the linguistic formulations of so-called schools of psychiatry or "deep" psychology, there appear to be striking contrasts and incompatibilities between theoretical structures which have been derived from a more or less common

* *Semantics* means signification or meaning and is derived from the Greek root *semeinein*. General Semantics may be considered a general theory of evaluation.

[1] Science and Sanity, by Alfred Korzybski. (Lancaster, Pa., The Science Press. An Introduction to Non-Aristotelian Systems and General Semantics.)

Instead of providing simply a book review of this significant work it seemed desirable to offer a somewhat extended discussion of Korzybski's theories and interpretations because of the definite contribution they make to psychiatric work— a discussion which might also serve as an introduction to a somewhat difficult text. This has been done upon request by Dr. Douglas G. Campbell who is making a clinical investigation of neuro-linguistic factors in behavior.—Editor.

substratum of clinical observation. Each school has its own metaphysics, the prototype of which may often be discerned in the classical structures of "Aristotelianism," "Platonism," "Realism" and "Conceptualism," "Monism" and Dualism," to mention only a few. And, far from there being merely a few deeply entrenched, antagonistic schools based upon broad doctrinal differences, within each of which the individual members are in substantial agreement, there seem to be in practice about as many schools as there are psychiatrists. For it is increasingly, albeit reluctantly, admitted by experienced clinicians that personal rather than common metaphysics guide the investigation and treatment of disordered human nature by the individual psychiatrist. Because of this individualistic trend in psychiatric theory, schisms occur within the rigid and frequently authoritarian parent schools; and a confusion of tongues ensues, which renders psychiatrists not only intolerant of each other, but, because of their lack of a common basis of understanding, unable to develop that degree of cooperation necessary to place psychiatry as a whole in its rightful place in modern medical science. School psychiatry has been likened by a social anthropologist [2] of great standing to the structure of various religions, the differences being verbal or terminological rather than formal or structural; for indeed there are some striking parallels in the form of rituals—verbal and otherwise—hypostatization (objectification) of fictions, "acts-of-faith," and the creation of inner circles of the "initiated," to mention only a few of the similarities. Relentless critics of both school psychiatry and religious systems have perhaps been not entirely unjustified in applying such epithets as "cultism," "demonology," "rank mysticism," to the practice and theoretical structures of such doctrines.

About all that we have as a common linguistic basis within our own ranks, and as a bridge to our medical and surgical colleagues, is the terminology of an obsolete nosology. Here we find a set of terms, some descriptive and relatively free from doctrinal implications, others insidiously doctrinal and transmitting from what is now regarded as psychiatric antiquity dangerously false knowledge about the conditions they are supposed to represent. And these terms, both good and bad, are taken by some to

[2] A. R. Radcliffe-Brown: personal communication.

represent "disease entities" which "attack" previously sound individuals in quite the same manner as "demons" were supposed to "possess" the "righteous." By others, at the opposite doctrinal extremes, these terms are treated as verbal fictions devoid of content, useless and misleading for any purpose. Certainly, it must be admitted, these diagnostic labels are quite out of accord with most contemporary dynamic views of personality structure and deviation, and at best act as the roughest sort of guide for purposes of classification, prognosis and treatment. The recent progressive subdividing of so-called schizophrenia can only end in there being as many schizophrenics as there are patients! And where, nowadays, is the dividing line between the "schizophrenic" and the "normal" personality? As Macfie Campbell states, "general formulæ are dignified, and diagnostic terms give comfort, but they are verbal symbols which are apt to do violence to the complexity of the facts." [3]

But disagreements between psychiatrists over the verbalistic issues of nosology are quite minor in comparison with the confusion and differences of opinion which are apt to occur at the deeper but equally verbalistic levels of psychopathology, where embittered argument, rancor, personal animosity, disdainful intolerance or condescending superiority appear when the polemics of school psychiatry are involved. This "Tower of Babel" situation in modern psychiatry is familiar to most of us. Many psychiatrists, eager to avoid the limitations and dogmatism inherent in school psychiatry, try to solve the problem by translating the terminology of various doctrines into less objectionable linguistic formulations; or, by adopting a "middle of the road" policy or "eclecticism" they achieve some comfort in terms of personal security or superiority at the expense and often the justifiable exasperation of the schools whose doctrines they "mutilate." Old wine in new bottles.

That the problem of language should be greater in psychiatry than in other medical specialties is implicit in the subject matter of psychiatry. Psychiatry deals, in the main, with those disorders of human behavior referable to the symbolic functions of human

[3] Campbell, C. Macfie: Destiny and Disease in Mental Disorder.

nervous systems, to those evaluational and representational processes involved at that gregarious human level of the individual-in-the-community wherein cooperation depends upon communication, and communication upon forms of representation or symbols. Not only is this the chief level, neurologically speaking, wherein disturbances belonging to the province of the psychiatrist occur, but the method of dealing with these disorders depends upon an understanding of these processes of representation and the actual utilization of them, chiefly in verbal forms, in therapy. This is to say that words or gestures are to the psychiatrist what instruments are to the surgeon. Our technology must include, then, a general theory of meaning and representation.

Gregariousness, at the human biological level, depends upon neurological mechanisms of symbol formation. Symbols may be defined as communicable forms of representation of low or high order abstractions made by human nervous systems. By means of symbols individual knowledge becomes verifiable and, thereby, collective or "common sense." Collective or racial knowledge may be stored as literature, works of art, architectural structure, scientific and mathematical formulæ, custom, tradition and so forth; and these extra-neural, phyletic storehouses of knowledge, the labor of dead individuals, may be utilized at will for contemporary purposes, revised, modified, discarded and certainly supplemented for the elective use of future generations whose destiny they have helped to shape. Symbols, as products of neuro-semantic and neuro-linguistic mechanisms unique to the human nervous organization, make it possible, theoretically at least, for each successive human generation to commence developing, in the sense of acquiring new knowledge for survival, where its predecessors left off; whereas at animal levels each generation starts where its parents commenced. This distinction is broad, of course, but it illustrates a fundamental neurological difference between animal and human biological levels, as a result of which the gregarious behavior in each field of life differs in mechanism. Korzybski has pointed out these broad distinctions, and to the uniquely human representational mechanisms underlying our forms of gregariousness he has applied the term *time-binding*.[4] The implications for human biology, espe-

[4] Korzybski, Alfred: Manhood of Humanity. Korzybski designates plant life *energy-binding*, animal life as *space-binding*, and refers to humans as *time-binders*.

cially where gregarious behavior is involved, should be obvious when it is admitted that the human organism is born into and becomes part of an environment consisting of symbolic factors as well as physicobiological factors. Biology, at human levels, acquires new dimensions—as White [5] says, "a temporal coordinate"—for it must take into its account of human development a humanly-created representational environment.

The representational aspects of our environment are chiefly linguistic, but any adequate account of these factors in human development would have to include the rôle played by forms such as music, the plastic arts, architecture and other non-verbal projections, which are integral parts of and specific to the culture-setting of a given human organism. This is the province of the social anthropologist, who accounts for personality structure in terms of the moulding effect of customs, beliefs, technologies and other evaluational practices of the community to which the biological individual belongs. Social anthropology has come to be as important a basic science for psychiatry as physiology and other medical sciences with physico-biological orientations. The synthesis of these varying modes of approach to the problem of human nature might be termed a general anthropology, or the "Science of man" for which Carrel [6] pleads. But the difficulties inherent in its formulation have been fully as great as those involved in producing a general or "unified field theory" encompassing both the quantum mechanics of atomic physics and the relativity mechanics of astro-physics. When, following Korzybski, we include the *time-binding* characteristics of human nervous systems in our theoretical and descriptive sciences, and recognize human agents of energy transformation as a *symbolic class of life*, the way is cleared for such a general theory to which *symbolic logic* will be as essential as is the tensor calculus to modern physics.

The evaluation of personality structure in any given case involves the recognition of these representational factors, which are chiefly linguistic, from the beginning of the social existence of the biological individual, and should include the rôle of such factors in

[5] White, W. A.: Twentieth Century Psychiatry. In this work many of Dr. White's observations are clearly traceable to Count Alfred Korzybski.

[6] Carrel Alexis: Man the Unknown.

the process of observation by the observer (the psychiatrist) who is also a part of the linguistic, symbolic environment. This is to say, in close analogy to the Einstein-Minkowski theory, that the individual-in-the-community exists as an object of study only in relation to the observer-in-the-community. In psychiatry, as in physics, our observations are relational, contextual, absolute only for a given field.

The term personality *labels* a complex of varieties of behavior in a human being, which exist in reference to other people in a specific culture group, and are dependent upon physico-biological mechanisms capable of analysis and description by the operational methods [7] of the morphological, physiological and psychological sciences. If the die of heredity is cast at the moment of conception, its imprint is not only modified by the physico-biological factors of intra- and extra-uterine life, but even to a greater extent, in the human agent, by the linguistic environment. Under the influence of myths, folkways, custom, superstition, medical opinion and the scientific knowledge of the day, which are communicated mainly by language and go to make up the linguistic environment of the newborn infant, are its inborn or "hereditary" physico-biological mechanisms of adaptation profoundly modified. For example, alimentary functions of the organism, in both their receptive and eliminative aspects, may be radically affected by the cultural evaluations of eating and eliminating of the community. When gastro-intestinal disorders occur the physiologically-oriented internist has frequently to turn to the symbolically-oriented psychiatrist for assistance in the diagnosis and treatment of a stomach or bowel which are expressing in non-verbal, but none the less meaningful and frequently dramatic, behavior their reactions to the linguistic environment of the individual-in-the-community whose interests they serve.[8] And most of us have had clinical experience of the effect of what might be termed the Lydia E. Pinkham mythology on the behavior of the female genital apparatus, not to mention the "psychic resonance" of such cultural factors apparent in so-called menopausal reactions!

[7] Bridgman, P. W.: The Logic of Modern Physics.

[8] Campbell, D. G.: Visceral Behavior in Neurosis. Can. Med. Association Journal, 34: 42-426, 1936.

Indeed, physiology as an independent science cannot exist at human levels because of the conditioning from birth by these symbolic or linguistic factors; and hence much of the reasoning by analogy, from animal reactions to human behavior, current in contemporary medicine must be fallacious when it is not actually false to fact. What the anatomists, physiologists and others observe in any human organism are relatively irreversibly conditioned mechanisms and structures (*e. g.*, posture)[9] the conditioning factors of which are a complex of habits, beliefs, affective states, etc., consequent upon the linguistic environment and mediated by parents, teachers and others, to the developing human organism. So firm is the amalgam of linguistic and physico-biological factors in the human economy that it is merely schematic to separate them. Modern medicine, when it does not take into account the linguistic environment of its patients, remains little else than a glorified veterinary science.

Symbols determine not only our individual personality structure, but also our social structure. Through the manipulation of symbols these structures, personal and social, are controlled and modified. As a symbolic class of life we are subservient to and coordinated by those agencies or forces in the form of individuals or sanctioning groups of individuals, which control our symbols. Whether these symbols stand for the guiding fictions[10] of personality configuration or the guiding fictions of political or religious social structures their *modus operandi* is similar; for they are orientators, and orientation produces organization. The symbols that stand for the conventional guiding fictions of latitude and longitude are essential for navigators; if they were disregarded or altered, without agreement by all concerned, navigation, being an organized, gregarious activity, would cease.[11] In the field of economics the manipulation of monetary symbols by those to whom control of

[9] Campbell, D. G.: Posture: A Gesture Toward Life. Physiotherapy Review, Vol. 15, No. 2, 1935.

[10] Vaihinger, Hans: Philosophy of As If.

[11] Carrol, Lewis: The Hunting of the Snark.

"'What's the good of Mercator's North Poles and Equators,
Tropics, Zones and Meridian Lines?'
So the Bellman would cry: and the crew would reply
'They are merely conventional signs!'"

such symbols has been "entrusted" affects group coordination and individual behavior alike. Symbol formation and manipulation in social groupings wherein the orientations are political, religious, or scientific may lead to increased social solidarity or to disastrous disintegration.

Communication, and thereby social intercourse, between two or more individuals is only possible where the symbol formation of those individuals represents collective empirical knowledge, or conventional guiding fictions. This is the basis of "common sense." Where the symbol formation is based upon private or personal evaluations, differing from the evaluations of other culturally-related people, we have the basis of so-called personality deviation, of which there are all gradations as far as the extremes of paranoia and schizophrenia. Communicability is probably the highest index of the capacity of the individual to adapt himself to communal life, and it depends upon the representational functions of the human cortex working in the organism-as-a-whole at social levels of behavior, and involving neuro-physiological, neuro-semantic and neuro-linguistic mechanisms. Upon communicability depends psychotherapy, which has as its first aim the re-establishment of lines of communication, and then, as its final goal, the development of the communication-potentials of an individual to their utmost social value. While not exclusively verbal, psychiatric techniques are mainly so, and therefore a knowledge of the higher cortical functions including evaluational (semantic) reactions, symbol formation and linguistic structure become essential for contemporary psychiatry. That psychiatrist will be most successful in therapy, who has mastered the science and art of communication.

As has already been pointed out, human gregariousness depends upon representational forms of communication. The transmission of mythology has been shown to determine the form of a society; verbalized beliefs control religious orientations; postulates of a science both direct and limit its field of investigation.[12] Experience at all levels of human life may be represented by symbols of which there are various transmissible forms providing a means of communication between contemporaneous "minds" or between sepa-

[12] See the writings of Radcliffe-Brown, Ogden and Richards, Poincaré, and Whitehead among others.

rate generations. Thus an extra-neural storehouse of human experience may be built up which overcomes the liability of the short biological span of individual human life in the interests of racial survival. As symbols, from this point of view, must stand for past or present collective experience (otherwise we are dealing with socially meaningless objects, spellmarks, or noises, which we find in schizophrenic reactions), the central problem involved in the mediating function of symbols becomes that of meaning or signification. If these forms of communication can act as representations of past or current human experience, as they actually do, wherein lies their validity? What are the connecting links between the symbols chosen and the empirical facts they are supposed to represent?

Any theory of human knowledge must include an evaluation of the rôle of neuro-physiological and neuro-semantic mechanisms involved in the acquisition of knowledge. The part played by the nervous mechanisms of the observer becomes part of the observer's knowledge. It was on this point that the new physics of Einstein and Minkowski modified the old, and a similar evolution has occurred in modern psychiatry when we admit that our interpretations of a given case are dependent upon our processes of evaluation. Neuro-physiological investigations have revealed some of the limitations of our sense organs or "analyzers," which, unaided by extra-neural instruments, do not supply sufficient data to the higher integrative levels of the nervous system for optimum survival value under the complex conditions of modern life. And neuro-physiology has also shown the mechanism of sensory projection so that the old "qualities of an object" have now to be considered as nervous constructs, phenomena dependent upon neuro-physiological processes of interpretation of inferential events. Many different levels of abstraction are involved in the acquisition of knowledge. We commence at neuro-physiological levels by making abstractions from physico-chemical events; further abstractions of higher order are made integrally with lower nervous activities at neuro-semantic levels where little-understood factors of interpretation labelled "interests," "appetites," "associations," "instincts," "drives," "purpose," "will," and other literary creations of the old psychologies operate as a unity in the organism-as-a-whole.

The only possible content of knowledge is structural. We do not know anything but the relationships between events—the events themselves being inferential. We apply the term structure to the design of the relationships between events, and the abstraction thus made is static at any given instant. But what is actually occurring, that from which our nervous system has abstracted a set of relationships, and which at macroscopic levels " seems " quite material, has been shown by contemporary science to be dynamic, changing, non-material. Human life, were it dependent today entirely upon macroscopic abstractions, would be precarious. Knowledge and conscious control of microscopic and sub-microscopic phenomena such as bacteria, viruses, vitamins and radiation are essential for survival under modern conditions of life. Primitive man, his nervous system unaided by extra-neural instrumentation and modern inferential methods, could not explore such new worlds. Each science " discovers," that is, abstracts, certain relationships between the events it studies. These relationships form a pattern or structure which in itself is quite " intangible " but capable of description or formulation, best in mathematical terms. A " natural law " is such a representation of a structural abstraction. It labels and describes a set of invariant relationships, observed at a given date, from which predictions may be made about future events belonging to the same series. As these sciences work at different levels, with strongly contrasting sets of facts, their structural abstractions have necessarily involved the use of contrasting terminologies. Very often, in fact increasingly so in contemporary science, the formulations have to be mathematical in order to describe the multiple factors involved or the dynamic-process character of the structure observed. Ordinary language, devised at prescientific periods of empirical investigation, adequate enough for macroscopic observations, has proved wholly inadequate for the representation of structural abstractions or knowledge at microscopic and sub-microscopic levels.

Forms of communication may be regarded as the products of neuro-muscular mechanisms which represent neuro-semantic and neuro-physiological processes of abstraction. This is to say that communicable forms of representation are produced by the effector apparatus of the organism. In the simpler forms of communication we find gesture and posture of smooth and striated muscle systems

expressing evaluational or semantic reactions.[13] In the more complex forms we find language and writing, and must not disregard the communication-value of non-verbal human fabrications as in architecture. There has been considerable scientific study of gesture amongst primitive people and civilized white infants and it is a fairly general conclusion that there is a similarity of structure between the gesture and the affective state that it represents. This is familiar ground to the psychopathologist dealing with the persistence of infantile reactions of an autonomic character in his patients. At the higher levels of communication, however, the connection is less obvious; the form of representation does not necessarily resemble in any way the thing talked or written about.

There is a striking analogy, suggested by Korzybski, between map-making and language-making. A map, be it territorial or a weather map, is used for the purposes of orientation. To be useful, which means often to have survival value for those using the map, it must be similar in structure to the territory or the data it represents. This similarity of structure depends upon order when the term order is used in the sense of "betweenness." The order of marks on the map must be similar to the order of geographical or other data. Thus it is seen that the only connecting link between the piece of paper with marks on it called a map, and the territory it is supposed to represent, is a similarity of structure based upon order. Naturally, an ideal map, if such could be drawn, would have to be multi-dimensional in order to represent in corresponding structure the multi-dimensional aspects of the territory. For purposes of the analogy it is essential to point out three obvious features about maps. The first is that the map *is not* the territory, though it represents the territory. The second is that the map represents *not all* the territory but leaves out many characteristics or negligible differences. The third is that maps are "self-reflexive" (Royce), which is simply to say that there can be a map of the map of the map, and so continuing; each order of map being a different representation produced by leaving out more and more characteristics of the original territory.

What can be said about the relationship of maps to territories can be said about the relationship between words or statements and

[13] See footnote 2, page 790.

what they represent. The analogy holds. A word or a statement *is not* the thing, object, fact or idea talked about. Any statement leaves out characteristics of that which it represents. Statements may be made about statements; there can be a word for a word. By means of language we can talk about language. Like maps, verbal representations to be useful, to have survival value for the user, must correspond in structure to what they respresent; and this similarity in structure will depend upon ordered relation. As examples of this principle of structural similarity, we have the situation in physics where for a long time the terms "space" and "time" were current, but with the new data discovered by the Einstein group these "elementalistic" (Korzybski) terms were replaced by the new, "holistic" (Smuts)[14] term, *space-time*. In our own field we have only to consult the clinical data to realize the validity of the hyphenated expressions, "body-mind," "organism-as-a-whole," "individual-in-the-community." Such terms do not split verbally what cannot be split on the silent, objective, neurophysiological, and neuro-semantic levels of abstraction. Such terms correspond in structure to the empirical data. At that, however, such terms still leave out many characteristics or negligible differences which have been abstracted or are capable of abstraction as our field of investigation widens.

With the content of knowledge consisting of structural abstractions, the aim of scientific investigation comes to be the discovery of structure. As new structure is discovered, new representations for that structure must be devised. Consequently, forms of representation need to be flexible. It is for these reasons, no doubt, that mathematical language was devised. Mathematics is a system of representation based upon the empirical data of multi-dimensionality and infinitesimals, etc. Structural abstractions are made by various forms or techniques of measurement. These abstractions are represented by arbitrary but conventional (communal) symbols which, in substance, consist of a limited range of signs (letters) to which an unlimited (infinite) series of other signs such as numerals may be attached as indices in various ordinal positions. In this way an extremely flexible system of representation may be built up in order to represent the multi-dimensional,

[14] Smuts, J. C.: Holism and Evolution.

multiple-factor, structure-function of the empirical data. When structural abstractions are represented by such a flexible system, similarity in structure between linguistic and empirical data is possible, and then, as it is usually easier to manipulate symbols than what they stand for, it becomes possible to make predictions. Predictability is essential for optimum human survival.

Because of the similarity in structure between mathematics and empirical structures, modern engineering becomes possible. None will deny the effect of modern engineering upon contemporary western civilization. With complete confidence we rely upon the structural abstractions and mathematical representations of engineers in whose public conveyances in the forms of skyscrapers, bridges, automobiles and airplanes we travel in space-time. Our contemporary system of human relationships is dependent upon an economic ordering or system wherein monetary values depend upon engineering capacity to predict resources. Without predictability we could trust neither buildings nor trains, industrial bonds nor tomorrow's food. Upon this predictability our "civilization" has been built, and the constant aim of applied science is to make predictability more accurate. Mathematical forms of representation with their high predictability value have, as a matter of fact, been confined to the physical sciences, and it is in these sciences that the most significant advances have been made. The biological and psycho-sociological sciences have not made nearly as rapid progress; and what new structural abstractions they have made have not had the communication and predictability value that exists in the physical sciences. Yet these sciences, anthropological in purlieu, are essential for predictability in human affairs; even the engineer who thinks he restricts himself to the abstractions from a physical series of events is dependent upon "the human factor." *Homo Œconomicus* has more characteristics than just pockets for his money.

Predictability depends upon the discovery of structure, representation of that structure by a language with similar structural characteristics, and then the manipulation of the symbolic devices within pre-determined restrictions, or form, to see what will happen under the conditions of such structural arrangement in the future. A stage designer makes a miniature stage, manipulates the miniature scenery, actors, lights and whatnot, thus foreseeing the effect

of certain combinations of these factors without the expense and effort entailed by trial-and-error experimentation in the gross. A mathematician predicts torsion stresses in a steel bar by measuring such stresses in a soap film wherein there are characteristics of corresponding structure-function to those of the steel bar. In both examples the materials are very different but the relationships are similar and may be represented by symbols for relationships. A chain of links has a serial structure. Represent that serial structure by a serial language such as a, b, c, d, e, etc., or 1, 2, 3, 4, 5, and it becomes possible to predict the position of any link simply by "looking at," or manipulating, the serial language arbitrarily chosen as a representation of the empirically discovered structure. The laborious trial-and-error methods of investigation become unnecessary; from a few measurements structure (structure-function) is discovered; a language corresponding in structure is invented; predictability is made possible.

While mathematics appears to be a neuro-linguistic device capable of representing the structural correspondence between the invariant relations of electro-magnetic phenomena occurring outside our skins and the invariants of "colloidal aggregation change" [15] at the basis of neuro-physiological and neuro-semantic reactions inside our skins, thereby permitting predictability and communicability in the affairs to which it may be applied, what may be said of the ordinary verbalistic language devices by means of which we conduct our personal, familial, national and international relationships, by means of which we educate our children and legislate our social and individual futures? As suggested above, our everyday forms of verbalization represent an extra-neural storehouse of human experience which survives the death of individual nervous systems which have in their turn drawn upon it and contributed to it. Obviously however this storehouse of structural assumptions, language, does not represent, in the main, current structural abstractions (science 1937), but rather the primitive archaic, macroscopic, prescientific sense abstractions such as those made by contemporary primitive peoples. This is the language of "animism" because of its lack of awareness that sensations, objects and symbols are nervous constructs of different *orders of abstraction,* projected on

[15] Burridge, W.: A New Physiological Psychology.

the outside world. Primitive and infantile people are forced, by the structural assumptions of such a linguistic, time-binding mechanism to live, as it were, in a demonological world consisting of objectified sense-abstractions, emotions, thoughts and symbols (words).

The structure of this primitive language is such, because of its subject-predicate form among other things, that dichotomous, or two-valued, cause-and-effect relationships are implied, whereas the empirical data of contemporary scientific observation indicate integrated, infinite-valued chains-of-events within which it is wholly schematic to isolate "cause" and "effect." And by its misuse of the verb "to be," (the "is of identity" of Aristotelian logic), confusions, misunderstandings and identifications at verbal levels of communication are produced which may have serious repercussions in other levels of organism-as-a-whole behavior. Many of the evaluating terms of the old language are "multi-ordinal" (Korzybski) in that their meaning depends entirely upon their context and so, without indication of their ordinal use or context, their meaning is indefinite and they may also produce confusions and identifications with associated behavioristic disturbances, maladjustments and so forth. Certainly many of the older terms and syntax represent a static universe misleadingly unlike the "restless universe"[16] revealed by modern scientific investigation. With these defects and many others this language is transmitting in an insidious way, and largely without our awareness, the structural assumptions of preexisting periods, thereby mediating not only inadequate but actually false knowledge. False knowledge lies at the foundation of most human maladjustment.

In psycho-sociological relationships, where, in economic, ethical, religious and political dealings with each other, this language is our only device of communication, it is easy to see that predictability is extremely low. The opinions of economists, the arid verbalizations of ethical systems, the inflaming utterances of religious and political leaders, not to mention our personal, individualistic, verbal predictions in such matters as love and friendship, have all shown their low predictability value, as the evidence of the changing economic order, the failure of ethico-religious systems, the frag-

[16] Born, Max: The Restless Universe.

mentation of political parties, and the evanescence of contemporary human "emotional" relationships have amply demonstrated. Yet with all its defects, its false-to-fact assumptions, it remains our chief form of communication, particularly for the more intimate person-to-person aspects of our gregariousness. Insidiously this language has conditioned our culture in rigid, dogmatic, categorical forms of evaluation (semantic reactions) which interfere with the investigation of new structural possibilities or, at least, produce blockages and reading difficulties in the comprehension of newer formulations about current structural abstractions. Any science involves more or less laborious techniques by means of which new structure is discovered. Once discovered, the new structural abstractions can be taught even to children, for the technicalities involved in investigation may be discarded. Younger people accept the new orientations more easily than do their less flexible parents, for whom the new assumptions sometimes necessitate painful reorientation and neural readjustments. When habits and automatisms of evaluation and representation derived from primitive or infantile orientation come into conflict with new structural abstractions resulting from the discovery of new data (science 1937), we witness frantic efforts on the part of a confused personality to make an adjustment by rationalization, repudiation, translation and other devices in an attempt to maintain the integrity of his old beliefs, orientations and functions. Where the incompatibility is too great, serious psychopathology may appear in the form of acute schizophrenic and affective reactions in the case of individuals, or in the form of mass hysterias, such as the "dancing madness" of the middle ages, New Guinea "Heady-go-Round," or religious cultism of our own era. Nor are those who have been scientifically trained spared these reactions to a disturbed *Weltanschauung*. It has been the fate of most original investigators to be ostracized when they discovered data which repudiated or altered the old structural assumptions. Thus it was with the bacteriologist Pasteur, with the psychiatrist Freud, and now, it may be, with the semantician Korzybski, only to mention original investigators of our own day.

Korzybski proposes nothing less than a complete revision of the old system of evaluation, implicit in the terms and structure of non-mathematical language, to bring it into conformity with the new structural data of contemporary sciences. The old system,

with its false-to-fact structural assumption, its two-valued, primitive, cause-and-effect logic, he calls aristotelian, more for the purpose of distinguishing it from even more primitive one-valued and contemporary infinite-valued systems, than in destructive criticism of Aristotle whose logic was, for its day, the best available. Just as Euclidean geometry and Newtonian physics deal with too limited areas of data for contemporary utility and have been replaced by broader, more general systems of geometry and mathematical physics, so must the aristotelian logic be replaced by a broader, more appropriate system of symbolic logic. The negation of false structural assumptions becomes, paradoxically, positive knowledge with survival value for its human agents. The new systems, with their unlimited range of operations, may be conveniently labelled non-euclidian, non-newtonian, non-aristotelian, etc., and thus they become free from the rigid, dogmatic and categorical characters of the antiquated.

The aim of a non-aristotelian revision of language is the adjustment of language structures to empirical structures. The map must correspond to the territory. The most important results of this, for education and psychiatry, are the elimination of false-to-fact structural assumptions which lead to individual and social maladaptation. Identifications are prevented; the principle of non-identity, now firmly established in the empirical sciences, is established and represented in linguistic structure. (There is, it must be noted, a restricted use of "identity" in mathematics.) With more precise forms of representation for the structural data of the day, the way is cleared for a new pedagogy. So-called Mental Hygiene could better be called *Semantic Hygiene* because of the structural implications of the new, *non-elementalistic* term, "semantic-reaction," which indicates evaluational processes of an organism-as-a-whole character.

The old forms of verbal representation are rendered more flexible by the application of certain mathematical devices, which Korzybski has cleverly modified in addition to the introduction of new terms.[17] Taken separately they have already been used, more or less unwittingly, by precise "thinkers" and writers. Five devices are

[17] For details see the works of Korzybski. Clinical reports showing the practical application of general semantics will appear from time to time.

used. They are: *indices, dates, hyphens, quotation marks* and equivalents for the expression *etcetera.* Indexing a term or a statement by numerals or qualifying terms restricts its field, putting an end to the dangers of generalization and identification. Dating a term or a statement has similar effects and implies the dynamic seriated character of any data about which static statements may be made. Hyphenation produces structural similarity by implying the "holistic" character of the empirical data. Quotation marks are extended to indicate obsolescent terminology, elementalistic words, inaccuracies of representation, which may be temporarily expedient to use, provided their indefinite meaning is indicated. By means of the term etcetera or its equivalents such as "and so forth," "among other things," and new punctuation devices for written language, the mathematical use of infinity as a generating process is indicated, and awareness of characteristics left out of any representational form is so introduced into our subverbal and verbal evaluations.

The application of these devices in "thinking," speaking and writing makes it possible for our evaluational and representational mechanisms to become flexible and in structural correspondence to the empirical universe of 1937. *Intensional evaluations* were implicit in the old logic: orientation was by definition and similarities as in the Socratic paradigm: "Man is a featherless biped." This is a statement which is true for all human beings but covers none. *Extensional evaluations* recognize differences as well as similarities: orientation is by "facts" or science, 1937. By extension, Man is a verbal fiction applied to a class including $Smith_1$, $Smith_2$, $Smith_3$, etc. Extensionally, too, $Smith_1$ 1936 *is not* $Smith_1$ 1937. With extensionalization of our evaluational processes identification, in its non-mathematical sense, ceases and the orientations of $Smith_n$ may become infinite-valued. One- and two-valued orientations, characteristic of primitive and infantile "thinking," may be eliminated, thus preventing much of the identifying, dichotomizing, so disastrous to personality structure. Statements and terms such as "all women," "all men," "superior," "inferior," "right," "wrong," with their frequently dangerous repercussions in behavior, because of their false-to-fact assumptions, may now be eliminated or rendered innocuous. Changelessness, rigidity, absoluteness implicit in the old orientations give way to the implications

of fluctuation, plasticity and the possibility of ever-new horizons in a non-aristotelian revision of logic initiated by such simple linguistic devices as Korzybski suggests. These new orientations are made available to the non-scientifically trained. What this may mean for social development, when the fetters of antiquated logic and beliefs cease to limit the forms of our interpersonal relationships, is more a matter of intuitive than accurate scientific prediction at the present day.

The search for structure in the various scientific disciplines creates a common problem, that of correlation and representation. At the present time the quantum and relativity mechanics are being related by the creation of a new tensor calculus which represents structural features common to both fields.[18] Investigations and representation in the fields of psychology and physiology have been apparently contradictory, or at least unavailable for each other, because of the lack of a " unified field theory " and a language with which to express it. J. T. MacCurdy[19] attempted this but failed of general acceptance, less because of his material than because of his aristotelian logic. Korzybski, by means of his non-aristotelian revision of logical systems, offers extensionalized forms of representation which may further the solution of these vexing and mainly verbalistic problems.

[18] Levi-Civeta, Cartan, Carnap, Eddington, Whitehead and others: Harvard Tercentennial, 1936.

[19] MacCurdy, J. T.: Common Principles of Psychology and Physiology.

NURSING SCHOOLS IN PSYCHIATRIC HOSPITALS.*

Report of a Survey.

By HARRIET BAILEY, R. N.

This survey, made under the joint auspices of the Committee on Mental Hygiene and Psychiatric Nursing of the National League of Nursing Education and the Nursing Committee of The American Psychiatric Association, was carried on through personal visits to seven nursing schools, located in six different states in New England, in the Middle Atlantic section and in the Middle West section of the country. Of the seven schools visited, six were in civil state hospitals and one in a private hospital. The list of schools was supplied by the Nursing Committee of The American Psychiatric Association.

Obviously, to visit only one hospital in a state in which there are several or many others under the same general board of control, does not afford a sufficient basis of knowledge to draw conclusions about the standards of the nursing and hospital activities in all those hospitals. Mental hospitals are like homes, so often do they reflect the ideals and standards of those who direct their various activities and share their performances. The organization and methods of administration may be similar, yet the results obtained may be quite different even when a state board of control and general committees standardize the various departmental activities.

This report will attempt to summarize the many observations and findings secured during this survey and contained in the detailed reports of each school.

The purposes of the survey were as follows:

1. To determine if the state hospitals for mental diseases should offer a basic nursing course.

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* In view of its importance and timeliness the Journal reprints this article from the American Journal of Nursing, Vol. 36, No. 5, May 1936, with the kind permission of that publication. Miss Bailey's discussion was presented at the round table on psychiatric nursing at the 92nd annual meeting of The American Psychiatric Association, St. Louis, Mo., May 4-8, 1936.

2. To observe the organization of the nursing school, its educational program, its application of the nursing service, and the standards of nursing practice resulting therefrom.
3. To determine the clinical resources of nursing education and practice that should be available if a school is to be organized or continued.
4. To offer recommendations along all these lines with a view to improvement in the teaching program and ward practice to the end that the mental patient may be better understood and more efficiently nursed.

Its scope was as follows: The information desired was formulated in 13 divisions. Questionnaires covering these were prepared and filled in as completely as possible during the visit. In an effort to be fair and accurate, impressions and deductions were discussed before leaving the hospitals.

Organization and Control of the Hospital School.

Six of the hospitals are civil state hospitals, supported by public funds; the seventh is a private hospital of more than 200 beds. All the state hospitals are controlled by a state board of control or commission, and in three of these the state civil service commissions control the appointments to the nursing staff and to the school on a non-competitive basis.

In all but one school there is a school committee, whose membership is variously made up entirely of hospital superintendents in one state; of a like group and one nursing school principal in another; and, in others, the superintendent of the hospital and principal of the nursing school are members. Only one committee has included an educator, the dean of a woman's college. The responsibilities and powers of this committee are quite uniformly advisory only, but their recommendations are influential in shaping policies and improving standards.

None of the schools has an endowment fund nor is there a budget separate from that for general nursing service.

The annual report of the school is submitted to the superintendent who may or may not include it in his report. The report of one school is printed in the annual report of the hospital.

Depending somewhat upon geographical location, the hospital's clinical resources are utilized for the instruction of medical students. This ranges from a full day of clinics once a year in one hospital to occasional clinics in two others. Students of psychology in a

neighboring university attend several clinics arranged for them in another hospital.

In many states, the richness of the educational resources of a civil state hospital are not yet appreciated by other educational groups. In one, included in this survey, however, these resources are being utilized to supplement the training of the following groups: medical students, dental students, theological students, nurses, mental hygiene students, students from a college school of social service, dietetic students from a college for women, and occupational therapy and physical education students. Both college groups received college credit for their practice there.

Proximity to a college or a university or other higher institution of learning is an important and valuable factor in stimulating the pursuit of academic and cultural courses by those residing in the hospital. One school organized a group so large that all could not leave the hospital at one time and arrangements were made for the instructor to come to the hospital. Two university credits were granted those whose academic credentials had been approved. The course, which continued for many weeks, was in ward management and teaching. The proximity of the hospital to higher educational opportunities should be considered when a nursing school is organized.

Graduate Nurse Staff.

The state hospitals as a group have been slow to realize the advantages of attracting to the principalship of their schools women with superior academic and professional education. This is one reason for the existence of minimum standards in so many of them. The graduates of years ago, with a minimum of academic education—often less than high school—and nursing education acquired during the period of custodial care, can hardly be expected to instruct and inspire students of nursing today, although their loyalty to the hospital and faithfulness to the patients would never be questioned. There are many positions now held by charge attendants on the chronic wards to which these older graduates would be able to contribute much in service.

The preliminary education requirement for student nurses has been raised in all the states included in this survey. Obviously, those who direct the nursing education and share the ward instruction

must meet this minimum requirement also. Progress has been made in improving the quality of the nursing staff, but much more needs to be done in many schools. The high educational attainments of personnel in other departments only tends to emphasize more clearly the deficiencies in the nursing department.

In several schools the graduate staff hold regular conferences at which problems of ward administration and projects relating to teaching or patient reëducation are formulated and discussed.

In two schools, the alumnæ associations contribute funds each year to be awarded as prizes for excellence in scholarship or practical nursing. This is an activity which could be carried on in every school.

Clinical Facilities of the Hospital.

Notwithstanding the quite general overcrowding in many hospitals, the classification of patients is well carried out in a majority of those visited. This is important from the standpoint of teaching. New buildings for the reception and clinic services or renovation of older structures have markedly improved the facilities for treatment and teaching.

One hospital offers a very fine clinic service and all have operating rooms and treatment rooms, but the activity in these departments obviously varies with the interest and activity of the medical staff in therapy and research. In two hospitals there is no pathologist; a technician in one and medical students in the other make the routine laboratory examinations.

Another obvious conclusion is that the degree of therapeutic activity depends quite largely upon the location of the physicians' offices. Where these are situated in the administration building or center, sometimes far removed from the wards, and only brief or hurried rounds are made, there is a striking diminution in the number of treatments ordered. Where the offices are located on the service, interest in every phase of treatment and ward activity as it affects the patient is apparent. It is, perhaps, superfluous to add that nursing standards on these wards are also improved. There is an alertness, an eagerness to serve the patients, which the physician arouses when he spends more time on the wards.

The special therapies, occupational, physical, hydriatic, and cosmetic, are established in all hospitals, but not equally well organized

or active. In one hospital, out of a total of more than 2500 patients, only 20 men and women were engaged in the occupational center. In this hospital, the industrial and housekeeping departments furnished all the occupation.

In two hospitals, no special hydrotherapist is employed, the head nurses or supervisors giving the occasional treatments. In marked contrast to these is the hospital where this service is very active, both day and night.

Two hospitals have no dietitian and therapeutic diets are minimum in number. The regular menus served the patients are uniformly below the standard of other hospitals. Outstanding is the state hospital where there are four dietitians, a chief and three others, who were assigned to the reception service, the clinic or hospital service, and the tuberculosis service. The chief dietitian had many charts which showed graphically the improvement in the patient's condition brought about by special diet. This hospital also has a special dining-room adjacent to the diet kitchen for all employees who are served therapeutic diets. Outstanding, also, in another hospital was the steward's interest. His eagerness to improve the menus was very genuine, as he believed that better food would make a more contented and coöperative group, which, in turn, would lead to new interests and hasten rehabilitation.

Visits to mental hygiene, parole, or child guidance clinics, and assignment to the social service department are not included in the educational program in all schools. Environmental factors in the community, in industry, home, or school so often contribute to the maladjustment which precedes mental illness, that nurses should have knowledge of these and knowledge also of the methods that are employed in the clinics to restore and maintain personal efficiency and to prevent unnecessary disaster. An acceptable educational program should provide that all students have opportunity to attend and share, if possible, the activities of the parole and other available clinics.

In five schools, women students receive no experience in the care of men patients. Strangely, this is extended in one hospital to the children's service where all the boys are under 15 years of age. This is a serious deficiency in the program of education in these schools. The acceptability of women nurses and students in some of the men's wards is no longer questioned. This custom is so universal

in general hospitals, and in mental hospitals has been so successful in improving nursing standards, that argument for it seems wholly unnecessary. During the short time spent on the men's wards where there was only male attendant service, a considerable number of patients, two of them physicians, asked why they didn't have nurses on their wards. "They help us to feel more at home" was the reason most frequently given. Can any one doubt how unnatural it is for an aging man, accustomed all his life to be looked after at home by mother, wife, or daughters, and in his business by women secretaries and bookkeepers, to be plunged when sick and helpless into an environment where only men, incompetent in nursing, must minister to all his needs?

Affiliations with general hospitals to supplement the clinical experience are made in accordance with state requirements for licensure and approved by the boards of nurse examiners of the different states.

The period of affiliation ranges from 12 to 20 months, during which time the students reside in the school of affiliation.

Physical Facilities of the Hospital.

All the civil hospitals had old buildings constructed in the asylum era to detain and confine those who were committed thereto. There are, however, great differences in the way the interiors have been renovated to meet the needs of changing standards of treatment. Five of the civil hospitals have new buildings for reception and clinic purposes, and foundations for these structures were nearing completion in another. All of them are, or would be, equipped to meet the demands of medical treatment and nursing care.

The service of food to large numbers of patients is unquestionably best handled by the cafeteria system which was established in two hospitals. So outstanding is one in excellence that it deserves special mention. The room is large, bright, and airy with ivory walls and red tile floor, easily entered from the hospital or from the grounds. All but the bed and infirm patients come here. At the entrances, the menu is printed on portable blackboards. A choice of three meats, several vegetables, two kinds of bread, two desserts, tea or coffee comprise the mid-day meals. Butter is served at every meal. Men and women come to this dining-room in a most natural

way, quietly and in an orderly fashion. They are not directed where to sit but many choose their companions for the meal. The service is excellent. Clean napkins are provided for every meal. The patients are quite discriminating in their choice of food and do not overload their plates knowing they can return for all they want to eat.

The superintendent states that, with the highly varied contents of the menu, the cost of food is no higher than under the old system, for waste is practically eliminated. Nor do the benefits end when the meal is eaten. To freshen the personal appearance, comb the hair, arrange the collar and necktie, tie the shoe laces, etc., three times a day to go to the dining-room surely must arouse pride in personal appearance and prevent deterioration.

One feature is outstanding in several of the hospitals—the utilization of products of the occupational therapy to supplement the ward furnishings. The wards in one hospital in particular are transformed by window draperies, bedspreads, pillow covers, table runners or covers made of muslin on which bright flowers are appliqued in striking and artistic designs.

Health and Recreational Facilities.

None of the schools visited had a health director, social, or physical education director for the students. In several, however, those who directed the recreational activities for the patients were much interested in helping the students to organize theirs. The hospital facilities, gymnasium, tennis and croquet courts, and golf courses, are all shared by the nurses. In one hospital, the horticulturist, a young woman, who directs the patients' gardening activities and nature study, planned for the nurses many picnics and hikes which included the study of birds, flowers, and trees.

All students are given thorough physical examinations and immunizations for smallpox, typhoid fever, and diphtheria.

Psychometric tests for general intelligence, mechanical ability, and personal adjustment are given in five schools, and in one, the general intelligence test only.

Vacations granted yearly vary in length from two weeks to 30 days. Time allowance for sickness ranging from 2 weeks to 90 days for the three years is granted in six schools. One school only does not allow any time for sickness.

The hours of duty vary greatly. Three schools have eight hours per day. In one state this is a law, and there the night duty is also eight hours. In the other four schools, the hours for both day and night duty are excessive. The fatigue and strain of ten hours on the wards for a week of six days is enough to deaden initiative on the wards and weaken interest in study. Several schools do not place their students on night duty during the period of active class work, but defer this experience until classes have ended for the summer.

Five hospitals have made adequate provision for housing their nurses. In one, a wing of a new hospital building is used; in another, the preliminary students are housed on the third floor of a hospital building, moving to the residence as soon as they are accepted into the school. A few of the residences are attractive with a hospitable, homelike atmosphere, while others are very institutional and just like the hospitals of which they are a part. There are probably no factors more potent in creating a happy, contented, hard-working group of nurses than pleasant living conditions, good food, and reasonable hours for recreation. The hardest and most disagreeable tasks can be faced with courage if one has been fortified by these.

The importance, too, of having a matron or housemother of refinement and interested in young people should not be minimized. Commonplace furnishings and bare walls appear less so when graciousness pervades the entrance hall and living-rooms.

One hospital transports by bus all nurses and attendants assigned to duty in buildings some distance away from the residences and dining-rooms.

One hospital still houses nurses and attendants in the same building, a practice long ago discontinued by institutions maintaining the better nursing schools. We do not in any way disparage or minimize the contributions to patient care and ward housekeeping that are made by a group of faithful attendants, but we do hold that one cannot strive to develop special interests and activities for the school and ignore a part of the residents. The social life of the attendants should be given considerable attention and special efforts made to help the more ambitious of them to make up scholastic deficiencies and acquire some of the cultural qualities which are so necessary for success in nursing.

Two residences had running water in each bedroom, and in all but one other the ratio of common wash basins, toilets, tubs, and showers to residents was acceptable.

Because of the quite uniformly fine hospital libraries, efforts have not been made to build up the libraries in the nurses' residences. In all but two of these several or many copies of current magazines were noted.

The location of the dining-room was satisfactory in all but one hospital where the only entrance was through the patients' dining-room and the general kitchen. Mindful of the very unpleasant approach, efforts had been made to make the room as attractive as possible by bright wall decorations, window draperies, and chair-back covers.

Three schools had cafeteria service, one had waitress service, and three had attendant-convalescent patient service. The quality of food and its preparation were satisfactory when judged from an institutional point of view. With one exception, cafeteria service offered the greatest variety of food and its preparation.

Student Body.

The numbers of students varied from 11 to 116. Only two schools have men students: one 6, the other 69. All the schools but one had a very high percentage of eliminations, one of 60 per cent, another 53 per cent. The lowest was 26 per cent. Most of these occurred during the first year, the period of most intensive classwork. The cost in effort, time, and absence from the wards is heavy and studies should be made of the factors that contribute to these results so that they may be reduced if possible.

One school very honorably and courageously refused to admit students last year, realizing that their present facilities for teaching and clinical experience are not up to the standards they wish to maintain for nursing education. The new buildings now under construction will provide not only fine classrooms and a new residence, but also will permit better classification of patients with facilities for better and more active medical and surgical therapy.

All but two schools receive students from general hospital schools in affiliations for periods of three months. The largest number was 40 students from 10 different schools. This is a state hospital school.

The next largest number is in the private hospital where 27 students were received from nine schools.

Postgraduate students, also, are accepted in four schools, but in two of these they are on an undergraduate student basis and receive the same instruction.

In all schools, the students receive a monthly allowance varying from $10 to $45. Payment of this allowance is deferred in one school until the completion of the four months' preliminary term, and in another it is increased at the end of this period. All schools discontinue the allowance during the term of residence in the school of affiliation.

Four schools ask an entrance fee, two of $50, another $40, and one has a deposit fee of $1 to cover laboratory breakage. One school that required the $50 fee used the fund so accumulated to buy books and equipment for the classrooms. Although the equipment for teaching is very limited, we submit that student fees should not furnish the classrooms. This is a responsibility the hospital should assume when it organizes a school of nursing. Rather should it provide cultural courses and scholarships. Other schools repaid the value of the deposit fee to the students in textbooks, capes, and uniforms.

In all but one institution, the attendant group is still the main reliance of the state hospitals especially on the men's division. One hospital had only 4 female and 70 male attendants for ward service; another had 197 female and 257 male attendants; and the private hospital had only 15 male attendants for ward service.

In only a few instances has any effort been made to establish any educational requirements for employment of this group, and the program of instruction for new attendants varied from 30 hours of well-organized teaching, to only such casual instruction as the different charge attendants could give. Obviously, much more attention should be given to the selection and preparation for service of this group if they are to be charged with the responsibility of administering potent drugs and nursing treatments.

Distribution of Nursing Service.

This study was made to ascertain the number of nursing hours per patient in a given period of 24 hours. Obviously, these are in

direct ratio to the numbers of nurses and attendants assigned to ward service.

The general ratio of nursing personnel varied in the state hospitals from 1 to 8.3 to 1 to 15. In this latter hospital, on a ward with many bedridden and infirm patients, the ratio was 1 to 22 and, on a chronic disturbed ward, 1 to 23. These figures undoubtedly explain the very large numbers of untidy, destructive, and assaultive patients in seclusion and restraint on these wards. Moreover, patients in other wards of this hospital were unhappy, uncoöperative, and resistive, with almost daily accidents to nurses, attendants, and other patients—a picture too typical of the old days of minimum care.

In the hospital having the largest general ratio of nurses to patients (1 to 4.1) some students were washing walls and ceilings of rooms, while several patients from this ward were left alone in a yard to indulge in various forms of deteriorated behavior. No efforts were directed toward interesting them in anything or toward diverting their activity into other channels, although some of them showed rather unusual degrees of curiosity.

Classroom Instruction.

The subjects of courses and the minimum number of hours are determined by the state requirements for licensure, but it was good to note that almost every school has exceeded the minimum requirements.

In four schools, the physicians are still giving the instruction in anatomy and physiology, bacteriology, and materia medica. In the other three, these subjects are taught successfully by nurse instructors who have had special preparation for teaching. These subjects call for many hours in the classroom and should include laboratory periods, to which the busy physician cannot give the required time, and from which he should be relieved so that he can give more time to the medical subjects which make such heavy demands later on in the teaching program, especially when affiliating students are received every three months.

In all the schools the courses making up the program in psychiatric nursing have been enlarged and instruction begins in the junior year. In only one school is a course in mental hygiene omitted from the curriculum though it was explained that some aspects of the subject are mentioned in other lectures.

Teaching Nursing Practice.

This is organized according to the requirements of the board of nurse examiners in the different states and is well taught in all the schools by the quite uniform methods of class demonstration and student practice.

In one school where the opportunity for application of some procedures to the patients in the hospital was very limited, this deficiency was being corrected by extra hours of practice in the classroom to acquire skill in performance.

The marked increase in the number and variety of treatments now prescribed by the physicians in many of the mental hospitals has greatly enhanced their value as fields for nursing education.

Clinical Teaching.

Four schools have well-planned programs for clinical teaching. Obviously, the success of this valuable form of instruction depends not only upon the interest of the instructors, supervisors, and charge nurses, but also upon the coöperation of the ward physicians, who, recognizing that treatment of the patient is a mutual problem of physician and nurses, will stop on ward rounds to hold brief clinics, or in a more informal way to explain the causes of the disordered behavior or the emotional variations and changes so that the nursing procedures may be more intelligently and effectively applied and executed.

One school was reorganizing its educational program. In another, it seemed that some of the ward physicians did not realize how valuable this form of teaching could be and plainly were not interested. In another, one physician was very much bored by the matter, but in some others, the whole atmosphere of the service was stimulating, with every one alert and eager to help the patient get well, or to make a happier adjustment to life in the hospital. As someone has said.

> The rehabilitation of a patient is almost directly proportional to the amount of personalization or individualization granted that patient.*

Case studies are made in most of the schools, but their value varies greatly. All principals and instructors are most eager for suggestions as to how to improve them and utilize them.

* Heldt, T. J., M. D.: Quoted in Mental Hygiene, 19, 686, October 1936.

In two hospitals, students on their respective wards demonstrated to all the other nurses then on duty treatments which the physicians had ordered for their patients. In each case, the procedure was well organized, each step explained with care and deftly executed. The patients coöperated fully in every treatment that was given.

Five schools have morning assembly when the night service transfers to day. Another school expected to inaugurate it as soon as the head nurses had been instructed about the procedure. These periods, although brief, can be made very helpful and educational.

Class and Conference Evaluation.

Lectures by physicians and psychologists, classes, laboratory periods, classroom demonstrations, morning assembly, ward demonstrations, ward clinics, informal ward walks with supervisors, and medical staff meetings were attended. A good bit of time also was spent in the departments of special therapy. All of the observations thus made tend to strengthen and emphasize the value to the medical and nursing services of a well-planned teaching program. Alertness, eagerness, interest, inquiry, may all be developed and fostered for the patient's benefit, or they may be lacking and service becomes indifferent, routine, and custodial.

The methods of teaching in classrooms ranged from the question and answer type with almost no use of the blackboard, charts, models, or specimens, and no correlation with any other subjects then being studied or with any ward activities, to a classroom demonstration where every student was employed. The student chosen by class agreement was demonstrating the nursing procedure that was taught by the instructor the day before. Another member of this class acted as patient. Every other member of the group observed and checked the performance, using the following outline, made in mimeograph form and distributed by the instructor:

Student Criticism.

Points to be noted.	Per Cent.	Good.	Poor.
Safety of the patient			
Comfort of the patient			
Therapeutic value of treatment			
Economy of time			
Economy of effort			
Economy of materials			
Neatness and finish			
Simplicity and adaptability			

At the completion of the demonstration, general discussion was held. Obviously, this type of teaching eliminated the boredom so often produced in such classes, and the students corrected—by their own observation and criticism of another's performance—faults that they, too, might possess.

The quality and standards of nursing on the wards should be a measure of the quality and quantity of instruction. It was gratifying to note that this was true as shown by the consideration given the patients, the technic and skill in executing treatments and other procedures, the service of food to bed patients, the infirm and helpless, etc. So often nurses have to work against the handicaps imposed by overcrowding, old buildings inadequately equipped for active therapy, and economies in the hospital budget and laundry service that prevent the use of napkins and tray cloths, the exchange of cracked and broken crockery, and other replacements.

Some excellent results of the practical nursing program were observed on the women's services. In one hospital, untidiness has practically been eliminated by taking those patients to toilet at frequent and regular intervals both day and night, and this result is in a hospital where 90 per cent are of menstrual age. Destruction of clothing is no longer a problem since every article the patient wears, whether personal or state, is marked with the patient's name. The savings to the hospital have been large, the superintendent stated. Clean ticking for pillows and mattresses has also corrected the destruction of bed linen, with savings far greater than the cost of new ticking and labor.

In one hospital, the beautician, whenever requested by the nurses, gives depilatory treatments to the old ladies who have unsightly growths of facial hair. They seem to appreciate this attention very much and are most coöperative.

The nurses' notes in several schools were very good, but in others they could be much improved. One of the most important nursing duties is to observe closely and record accurately the symptoms, often unexpected and transitory, which the patients disclose by changing moods; unusual, impulsive, or inhibited behavior; and the content of thought expressed spontaneously or in response to audible voices, or those of purely psychogenic origin. Many noted psychiatrists have acknowledged the help these notes may give in completing the social or medical history and supplying additional

facts upon which to base diagnosis and treatment. To minimize the importance of or neglect instruction in this phase of nursing is to place a handicap upon the nurses' efficiency in the graduate nursing field. In one medical staff meeting attended, the clinical director read from the nurses' notes when the patient came before him. At this session, six student nurses were present and were much impressed with the value of accurate records. One student who had given the patient much individual attention was asked to describe the patient's reactions thereto.

Classrooms and Library.

Four hospitals have provided adequate classrooms. In three of these, they were arranged in a unit comprising class and lecture-rooms, demonstration room, science laboratory, dietetic laboratory, instructors' office, and connecting corridors utilized for bulletin boards, exhibits, etc. Another hospital provides all of the neces-sary rooms except the science laboratory but they are scattered. The other three hospitals have adapted single rooms in the hospital for class and demonstration rooms using the hospital laboratory for limited laboratory demonstrations. The course in nutrition and cookery in another school is taught in the high school laboratories by the high school dietetics teacher. Another hospital was correcting its classroom deficiencies. A new building already under construction contains excellent plans for a teaching suite.

There is a wide variation in the amount of equipment provided for teaching. One classroom has two skeletons and a very large number of dissectible models of the torso and viscera, a full set of anatomical charts, laboratory specimens, a projectoscope, etc. Another has only three charts, a model of the brain, and a skeleton much in need of repair.

The equipment for teaching practical nursing procedures also shows wide differences in quantity, variety, and arrangement. So limited were the common utensils in one classroom that they were assembled from the operating room, treatment rooms and wards just before class time. The maintenance of a school of any type today presupposes the provision of classrooms and equipment that are adequate for teaching. They are absolutely essential for teaching the nursing arts.

All the schools have reference libraries. One school has several copies of the more used books and sets of these are placed in different parts of the educational unit and easily accessible to the students at all times. Another library is located in the principal's office from which books are loaned and charged to the borrower. In another hospital, the charge nurses brought their textbooks and nursing journals to their wards for ready reference. A total of 206 books and 67 journals containing special articles were so placed in the charge nurses' offices.

The requirements for reading also varied greatly, as did the utilization of the assignments. One school required a review of some book relating to the subject of psychiatric nursing or allied subjects.

The extent to which reprints, leaflets, newspaper clippings, etc., are used through the medium of the bulletin board differs widely. This simple practice is used to vitalize the teaching in three schools, and in the others neglected. Can there be any doubt of the differences in students' attitudes and performance on the wards when schools have such variable standards of instruction?

Records.

The importance of adequate records, both for the ward service and nursing school, is recognized by all, due in part to the regulations of the state boards of nurse examiners and the state requirements for licensure. In one school the record system was being revised and another was urged to do so because some of the records in use are quite out of date, require a good deal of time to complete, and in the end do not show the full content of the educational program. Several systems of records for nursing schools are available and a few states prescribe their own. There would scarcely seem to be any good reason why the record system in every school should not be adequate to ensure safety, accuracy, and economy of time on the wards, and a complete report of all necessary data for evaluating the nurses' education.

Conclusions.

There can be little question that the vast educational resources of the civil hospitals, when properly organized, offer unusual opportunities for nursing education. The large numbers of patients

in a group (when classification is well carried out) produce a composite picture of symptoms that is impressive and at the same time emphasizes individual differences in personality that must always be given consideration when efforts are made to correct maladjustments or institute measures of reëducation. The increased activity in medical, surgical, and special therapy that has been developed in many of these hospitals greatly enriches their value as teaching centers.

But more than presenting opportunity is needed to make them available for nursing education. There must be not only a real interest in education on the part of hospital administrators and physicians and a willingness to provide nurse instructors and the facilities and equipment essential for teaching and practice, but also the clinical resources of the hospital should be made available and the responsibility for the instruction, both formal and informal, should be shared.

The private hospital included in this survey has a long and honorable record of outstanding service to the mentally sick. The smaller number of patients, the constant demands for special nursing service, the attitude toward all nurses inherent in so many groups of privileged patients, the inclination to limit the clinical study to patients who show varying degrees of deterioration rather than those whose prognosis is hopeful, all tend to limit the private hospital as a field in which to conduct a school of nursing.

On the women's division only two patients were requiring bedside care and these had special graduate nurses. Very limited opportunity is presented for the young student to develop skill in the art of nursing which can only be acquired through repeated performance, not on inanimate doll or healthy classmate but on patients who are sick and for whom the treatments or procedures are prescribed as a part of medical therapy, the results of which must be closely observed and accurately charted.

The private hospital seems best qualified as a teaching field for affiliating students from approved general hospital schools, and for postgraduate students. These groups have not only acquired skill in the execution of nursing procedures and a considerable amount of medical knowledge, but they also have gained insight to and understanding of sick people, and have acquired poise and assurance in approaching patients, and these are strong factors in

gaining their confidence and coöperation. They are also better able to obtain from their contacts with and service to the patients clinical information which may not be presented in class or clinic but may be followed up by individual research in the library.

The advantages of promoting educational activities in any hospital are recognized generally, but in a hospital where the personnel is largely resident and quite stationary it is the more necessary if the patients are to receive the full benefit of medical research and intelligent, skilful nursing.

To organize and conduct a nursing school necessitates an increased budget to cover expenditures for specially qualified nursing staff and school faculty, equipment for teaching and ward service, and shorter hours of ward duty for students. Therefore, it may be expedient for only one hospital of a state group if the number is small, or several if it is large, to conduct a nursing school or schools, the graduates of which would be largely absorbed by the other hospitals in positions of general duty, assistant charge nurse, charge nurse, and supervisor. Obviously, the hospital that organizes a school should, if possible, be so located that advantage may be taken of the cultural and educational opportunities offered by colleges, universities, or other higher institutions of learning.

The recommendations that follow are general in character and involve a repetition of principles that are familiar to and accepted by nursing school administrators. However, the need of more fully incorporating them in the organization and conduct of some of the schools of the survey was evident.

RECOMMENDATIONS.

Organization and Control.

To conduct a school of nursing the hospital executives and the medical staff should be actively interested in all those aspects of nursing education which affect and hasten the cure and rehabilitation of the patient and increase the effectiveness of nursing practice.

A school committee should be appointed, its membership to include the superintendent of the hospital, the principal of the nursing school, representatives from the board of trustees and the alumnæ association, an educator who is interested in community health, and a community representative who is interested in the educational needs of nurses and cognizant of the nursing needs of the community. This committee should meet regularly.

A budget to cover the necessary expenses of the school should be a separate item in the general budget for nursing service.

Graduate Staff.

The nursing school faculty, and in particular that member who has charge of the educational program, should be qualified by academic and professional education and experience. These qualifications are enumerated in the brochure, *The Nursing School Faculty*.*

All graduate nurses, whether in administrative positions or general duty, should be registered in their respective states.

Staff education programs should be instituted and regular meetings or conferences held.

Members of the school faculty and charge nurses should be encouraged to pursue advanced educational courses whenever possible.

Courses for supervisors and charge nurses in ward management and teaching should be given at the hospital by a qualified visiting instructor if attendance at college for courses is not possible.

Members of the alumnæ association should be organized to further some project for the school, a fund for prizes, scholarships, additions to the library, etc.

Clinical Facilities of the Hospital.

These should include every aspect of psychiatric therapy accepted in medicine today; and also those preventive measures and activities carried on in the community under the general term, mental hygiene.

Practice on selected wards for men should be provided.

Practice in the departments of special therapy should be provided.

Practice in a general hospital approved for affiliation should be provided for a period of not less than 12 months.

Physical Facilities of the Hospital.

These should be adequate to permit nursing practice to be executed as taught in the classroom without compromises in technic, or acceptance of conditions that may contradict or nullify the principles of good procedure.

Facilities for observation of patients in seclusion must be provided.

Health and Recreational Facilities.

Physical examinations should be given not only upon entrance but each year thereafter.

Vacation time should be not less than one month each year.

Hours of required ward practice and formal class exercise should not exceed 48 hours per week.

Hours of night duty should not exceed 48 per week, and should be given, if possible, after the class program is completed for the year.

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* Prepared by the Committee on Education of the National League of Nursing Education. May be obtained from the National League of Nursing Education, 50 West 50th Street, New York City, New York. Price, 75 cents.

The nurses' residence should be a separate building, and should include facilities for recreation and social activities.

Bath and toilet facilities should be in a ratio of not less than one to five residents.

Supervision of the residence should be given by a person of refinement and interested in young people.

Student Body.

Student nurses should be selected with more regard for their cultural qualifications and maturity.

The attendant group should be selected with the view to their remaining permanently in service. Their instruction should be organized and other efforts made to develop a contented, trustworthy, and efficient group of workers.

The general ratio of nurses and attendants to patients in hospitals conducting nursing schools should meet the minimum of one to eight prescribed by The American Psychiatric Association. This ratio will be influenced by the hour schedule in effect.

Classroom Instruction.

The basic sciences, anatomy, physiology, and bacteriology, should be taught by the laboratory method.

Orientation courses in psychiatric nursing should be given in the first year.

The curriculum should be revised at such intervals as may be necessary to make it conform to changing standards.

Clinical Teaching Program.

A program of clinical teaching should be planned and carried on by physicians, instructors, supervisors, and charge nurses.

Better correlation of all classroom instruction and nursing practice should be made.

Classrooms and Library.

The teaching unit should include class and lecture rooms, demonstration room, science and dietetic laboratories, and instructors' office.

The equipment of these rooms for teaching should meet accepted standards.

The reference library should include the standard nursing and medical textbooks, journals, and periodicals. Its location and control should favor accessibility.

Records.

Those required for the school should in number and content conform to accepted standards. The new records of the National League of Nursing Education are recommended.*

Those required for ward practice should meet not only the need for safety and efficiency in procedure but also have educational value.

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* Sample record forms may be secured from the National League of Nursing Education, 50 West 50th Street, New York, N. Y., for 15 cents.

A NEW TREATMENT OF SCHIZOPHRENIA.

By MANFRED SAKEL, M. D.*

I shall here attempt to give a short account of a new treatment of schizophrenia. As I have reported elsewhere, I have been successfully using large doses of insulin in the treatment of morphine addicts to alleviate the withdrawal symptoms. I at first used doses of insulin just large enough to pacify patients who grew excited after the withdrawal of morphine, or to produce somnolence, and in many cases I was thus able to considerably shorten the length of treatment. Certain theoretical considerations, which I shall later describe, encouraged me to use larger insulin doses on schizophrenic patients. I succeeded at first in pacifying some excited patients; later I went a step further and successfully treated a series of schizophrenic patients at the Vienna University Klinik with very high doses of insulin.

One patient, for example, developed a psychosis marked by extreme excitement and confusion, during which he refused to eat, showed definite catatonic features, stereotypy of movement, and marked general tension. He lay in our hospital for several weeks in a cage bed, under restraint. By treating him according to the method which I shall soon describe, it was possible to bring the patient back to a condition where he could resume his work and go his way again, free of psychotic symptoms.

Another case—a women—showed her first mental changes 11 months ago: confusion, increasingly severe catatonic features, and many days of mutism and negativism. She refused to eat, and had alternate periods of excitement and complete apathy. The patient went rapidly down-hill, and the prognosis, which looked uncertain at first, looked gloomier as time went on. The case was diagnosed by consultants as a hebephrenic schizophrenia.

In both cases, various other attempts at treatment had been made without success. Today, the young woman is again at work and

* From the Neurological and Psychiatric Klinik of the University of Vienna. Chief: Prof. Dr. Otto Pötzl. Read before the Verein für Neurologie und Psychiatrie in Vienna, Nov. 14, 1933. Translated by Joseph Wortis, M. D., Bellevue Psychiatric Hospital, New York.

shows no signs of abnormality. She is quiet, composed, emotionally stable, and shows nothing to suggest her former illness. In both cases, the patients have slowly been able to recall the events of their psychotic episodes and show corresponding insight.*

I shall now only briefly indicate the principles of treatment. It consists essentially of the production of consecutive daily shocks with very high doses of insulin; these occasionally provoke epileptic seizures, but more frequently produce somnolence or coma, accompanied by profuse perspiration—in any case a clinical picture which would ordinarily be alarming. The patient may show sudden improvement after the first shock, but more often there is a gradual improvement after a series of shocks. In this phase of treatment, however, the response is still fluctuating and unstable, so that further treatment is necessary to stabilize the remission.

I am perfectly well aware that this method of treatment under unskilled hands may be dangerous. It is true that any sudden alarming complication during hypoglycemia can be quickly relieved if glucose is administered in time, but I know that this may occasionally fail in some cases. When we consider, however, that the patients who come to us for treatment are generally looked upon as lost or very seriously ill in any case, I think there is very good justification for attempting a therapy, however dangerous, which gives some promise of success. The experience we have had up to now holds out this promise.

I have attempted to bring some system into the therapy, so as to minimize the dangers and to assure the best possible therapeutic results. I therefore divide the treatment into phases. In Phase 1, moderate or moderately large doses of insulin are used in increasing amounts until coma is produced. Excited patients may be more or less pacified in this way at the beginning of treatment. Phase 2 consists of the production of a series of more or less protracted and severe hypoglycemic states. These may either be called "wet shocks," during which the patient sweats profusely, grows somnolent, and goes into deep coma, or else, "dry shocks," which are more likely to introduce epileptic fits with their accompaniments: bad pulse, biting of the tongue, etc. These two forms of response

*The second of these cases is still at work and symptom-free. I have been unable to trace the first case.—M. F. (September, 1936).

cannot be predicted in advance: in any case they are certainly not dependent on the size of the dose. Phase 3 consists of a rest period of one or more days, during which the patient gets no insulin at all, or in special cases no more than is absolutely necessary to keep the patient quiet. Phase 4: sufficiently large doses of insulin are again given to produce mild hypoglycemic reactions for a short period (usually about two hours); special care is taken at this stage, because the patient may in the meantime have become hypersensitive or relatively insensitive to insulin.

The reactions of any single patient in the course of treatment are very variable, even when the doses of insulin remain the same. Patients, however, who go through the whole course of treatment tend to respond somewhat as follows: Phase 1 pacifies excited patients or may activate a stupor, and has a good effect upon the patient's general condition; it is possible that it diminishes the dangers of the second phase. Phase 2 represents the actual attack on the disease. Phase 3 is meant for recuperation and observation. Phase 4 is for stabilizing the effect and composing the patient. This scheme of treatment serves at present, but is not meant to be very strictly observed and I am far from thinking it will prove permanent.

It will be said, very properly, that spontaneous remissions occur in schizophrenia too. Those, however, who have had an opportunity of observing patients under insulin treatment, soon realize that the response of patients to individual shocks is specific—one sees the patient change with every shock, and the change is at times so definite and striking that the possibility of a spontaneous remission is out of the question. Moreover, the frequency of these "spontaneous remissions" under treatment has been so great that I must have been singularly fortunate to see the majority of my patients experience them just at this time. It should be mentioned, too, that the diagnosis of schizophrenia was in no case made by me alone, but by reliable authorities and clinicians at the University Klinik.

I have developed a working hypothesis for which no special claims of validity are made. Though the facts are as they have been described, the theory is only one of several possibilities. It may be wrong, but it has so far proved serviceable.

Though it is clear that the shock plays a conspicuous rôle in the therapy, the main factor appears to be the hypoglycemic state. It has long been known that a shock may relieve a mental disease. It is also known that severe illness may for a time favorably influence a case of schizophrenia. All these effects, however, are transitory. It is my belief that the effectiveness of the hypoglycemic insulin treatment is due to the action of the insulin directly on the cell itself. You will recall that various substances are known to influence the cellular activity of the brain. Fröhlich and Zack, for example, have shown that purine substances increase the permeability of the cell. Hoff has shown that Vigantol renders the cell membrane impermeable. On the assumption that certain substances may thus fundamentally change cellular activity, I advanced the theory in previous papers that the cells are continuously exposed to the action of a stimulating substance resembling adrenalin, and that insulin was its antagonist. The significance of adrenalin in excited states has been demonstrated by the findings of Pötzl and Hess, who showed that there is a marked increase of sugar in the spinal fluid in most excited states. It may perhaps be assumed that an increase of spinal fluid or blood sugar is associated with an increase of adrenalin in the blood or cerebrospinal fluid system.

It was my assumption that the products of the adrenal system sensitized the cells excessively, so that normal adequate stimuli produced pathological effects. Insulin opposes the action of the products of the adrenal system, so that excessive stimuli are muffled, and the cells kept relatively quiescent, to the benefit of the individual. This is without exception the response in Phase 1 of the treatment.

Now this stimulating hormone, as I picture it, not only overstimulates the activity of the individual cell, but also revives forgotten phylogenetically ancient and infantile nerve pathway patterns, which are normally latent and subdued in healthy, waking thought. In the pathological conditions here described, all these primitive patterns are called into action again; they interfere with each other and produce the picture which Stransky has aptly described as "intrapsychic ataxia." These nerve pathway patterns are shattered again by the shock of Phase 2, and the normal pathways again take precedence. In the convalescent period, the pathological nerve pathway patterns are still subdued, as they nor-

mally should be, and normal pathways are revived and enjoy their normal prominence. In Phase 4, this prominence is reinforced by further insulin injections, and the normal cellular relations are then said to be polarized.

To summarize: I have here indicated a method of treating schizophrenia, by the production of hypoglycemic states or severe hypoglycemic shocks by means of insulin. I have described a preparatory phase in which moderate or moderately large doses are used, and a similar terminating phase during which only mild hypoglycemic symptoms are produced. Our experience up to now indicates that this treatment is effective, but there have been no extended observations.* The treatment is dangerous in unskilled hands, but I believe from what I have seen that it promises success. I do not know whether this is the final therapy of schizophrenia, but it is an approach, and the purpose of this report is to commend it to your consideration.

AN ILLUSTRATIVE CASE HISTORY.

Translator's Note.—The following case is chosen from among 25 seen by the translator during a two months' period of study of the method in Vienna in 1934, to illustrate the variation of response from day to day, and the progress of a single case. The case was personally observed from an early stage of the treatment until the final discharge, and the history is translated literally from hospital records and stenographic notes. It should be emphasized however that no two cases run the same course, and that the treatment has since been modified in at least three important particulars: (1) By limiting the insulin administration to but once a day, except in the case of excited patients, (2) by reducing Phase 3 (the rest phase) to but a single day unless for special reasons further rest is necessary, and (3) by terminating the hypoglycemic state before the onset of coma in certain cases.

Dr. N. N. Physician, 40 years old. This patient was said to have been restless and irritable for a few years preceding his admission to the Vienna University Klinik. His first admission was on August 21, 1934, at which time his wife, who had some medical training, gave the following account of the patient's mental changes: The first marked mental changes, she said, occurred early in the year. In February, 1934, the patient began to complain that his body felt different, and that he felt his appendix ought to be removed.

* Since this time, Dussik and Sakel have reported on 104 cases (Ztschr. f. d. ges. Neurol. und Psych., 155: 351-415, 3 Heft, 1936) and Max Müller of Münsingen, Switzerland, on 111 cases (Schweiz. med. Wchnschr. 66: 929-935, 1936). J. W.

He began to act strangely towards friends and relatives, and his interests seemed forced. He began to say that he "would go crazy." He talked little and his behavior was distant and peculiar. He took to playing cards because he "didn't want to think of anything." Since the end of June, 1934, he had been taking his son and a neighbor's 13-year-old daughter out for walks, and he declared that he felt "a strange sexual attraction" for her. She "purposely excited" him. He would caress her. The neighbors complained to his wife and a quarrel resulted which excited the patient very much. The patient held an official position in the city health service and soon felt obliged to go on a vacation to rest his nerves. On returning, charges were pressed by the neighbors because of what had happened, and the patient again became excited and depressed. On the evening of August 20, 1934, the patient kept pacing up and down, said he felt frightened, and said that he was being hypnotized by a certain brother-in-law who lived far away. He was extremely restless throughout the night and in the early morning ran out into the hallway, talking in a vague way of political enemies, so that it was finally necessary to bring him to the hospital.

At the time of this admission, the patient was affected and artificial in manner during examination, and was evasive when questioned. He kept smiling knowingly and spoke of "a silly sex affair" that got him into trouble. His talk was at times irrelevant; he said he "was being hypnotized by a brother-in-law," but refused to give further information. Except for his dilated pupils and a tremor of his outstretched fingers, the physical examination was completely negative.

On the day of admission, the patient was excited and noisy and had to be restrained. He kept calling the name "Hugo!" in a rhythmic stereotyped way. Sedatives were necessary to pacify him. On the following day, the patient continued to be noisy and excited, kept grimacing, and reacted to auditory hallucinations. He also complained of bad smells and of a bad taste in his mouth. His excitement subsided, however, in two days, though he still had numerous persecutory delusions. During the following week, however, the condition of the patient improved considerably. On September 7, 1934, he was able to give a lucid and objective account of the events leading to his admission. On September 17, he was sufficiently improved to return home. During this first stay at the hospital no insulin treatment was attempted.

The patient went on a vacation and behaved well for the next two weeks. On the 14th day after discharge, however, he again grew restless and sleepless, spoke of "involuntary muscle tension" and complained once more of being watched and persecuted. He had numerous bizarre delusions, reacted to auditory hallucinations once more, and finally attempted suicide.

On October 5, 1934, patient was brought to a private sanitarium, where he stayed for a month. He continued to be psychotic and more or less excited throughout this period, and made two further attempts at suicide. The patient was admitted to the University Klinik a second time on November 7, 1934. At this time he was tense, restless, and depressed. He refused at first to answer questions, and later stretched both his arms out in a bizarre way,

wept, and said he blessed everybody. The examiner could make little contact with him during examination.

November 8, 1934. Patient's behavior was silly and bizarre, and he was at times noisy and excited. He continued to actively hallucinate. Alkaloids, barbiturates, and paraldehyde were necessary before the patient could be brought to sleep.

November 9, 1934. The patient was tense and restless and complained that electric shocks were passing through his body. He talked incessantly and incoherently: "Maybe you say it—or I say it—one of us must go—that is paranoia—but they were not voices—those were flashes of light—something is rotting—I smelt something rotten here—I saw—grey cross, green cross on green field—less voices—a face—gone already. (Why did you cry yesterday?) I have a soft heart; do you know you can cry from pain—that is a pain, assuming you can cry, that is a reward, for being questioned today—. (Do you hear voices here too?) That is terrible. I get frightened here—(Of what?) You don't have to know—." Patient was excited and assaultive and had to be removed to the disturbed ward. "You are all my enemies anyway and want to kill me," he said. The patient was given 1 mg. scopolamin at 8 p. m., but did not fall asleep until 2 a. m.

Insulin shock treatment was begun on November 10, 1934.

November 10, 1934. (First day of treatment.) Patient was given 25 units of insulin intramuscularly at 7 a. m. The patient showed no apparent physical reaction and no apparent mental change. The hypoglycemia was terminated with a feeding at 11 a. m. The patient was given 40 units of insulin in the early afternoon and 40 units again at 6.30 p. m. He was given carbohydrates in both instances two hours after the injection. He showed no apparent physical or mental reaction.

November 11, 1934. (Second day of treatment.) The patient was given no insulin to-day. He was very noisy throughout the day and had to be restrained and medicated with sedatives.

November 12, 1934. (Third day of treatment.) The patient was given 45 units of insulin intramuscularly at 7.30 a. m. At 10 a. m. the patient was found kneeling in his bed as if in prayer, and he seemed very excited. Soon afterwards, the patient grew more accessible. He spoke to the examiner and said he got his medical degree in 1924, but he dropped the subject suddenly and said, "This is more important—this is an anxiety psychosis—gas—I'm going completely crazy—I am terribly afraid of smells—." At 11 a. m. the patient grew somnolent and began to perspire profusely. He was given carbohydrates at 11.15 and was very disturbed for the rest of the day. Restraints were again necessary.

November 13, 1934. (Fourth day of treatment.) The patient was given 45 units of insulin at 8.30 a. m. Soon afterwards, the patient said that they had been sprinkling poison gas around the place. (Actually, the ward had just been disinfected.) The patient again kneeled in bed but was quiet. He again grew more accessible and once more responded to simple questions, but when asked where he was, he gave the name of some private sanitarium.

The patient was given carbohydrates at 12.30 and continued to be very disturbed throughout the day.

November 14, 1934. (Fifth day of treatment.) The patient was given 50 units of insulin at 6.30 a. m. At 11 a. m. he was resting easily in bed, and when asked how he was, he answered, "They say it is persecution mania—maybe it is a sickness—lots of things aren't natural—maybe I have paresis though—maybe I have syphilis—." The patient dozed quietly thereafter and was given carbohydrates at 12 o'clock.

November 15, 1934. (Sixth day of treatment.) The patient was given 60 units of insulin intramuscularly at 7 a. m. He dozed easily thereafter and perspired freely. He was given carbohydrates at 12.40 p. m. He was given 60 units of insulin in the early afternoon, followed by carbohydrates two hours later, and another 60 units at 7 p. m., followed by carbohydrates at 9 p. m. He showed no marked reaction to these injections. The patient slept without sedatives that night.

November 16, 1934. (Seventh day of treatment.) The patient was given 60 units of insulin at 6 a. m. He was calm and somnolent throughout the morning, spoke reasonably, said he was hungry, and that he would like to walk around. He promised to go back to bed if he began to feel unwell. The patient was given two further injections of 60 units of insulin at 2 p. m. and again at 6 p. m., both injections being followed with a carbohydrate feeding two hours later. The patient was quiet and more accessible throughout the day, even in the non-hypoglycemic periods, and walked easily about the ward.

November 17, 1934. (Eighth day of treatment.) The patient was given 70 units of insulin at 7 a. m. At 10 o'clock the patient was drowsy and perspiring freely. When questioned he said he slept well last night and didn't have any dreams. "Now I feel sort of inhibited," he said. When asked if he was sick, the patient shrugged his shoulders as if to say he didn't think so. When asked about his behavior on the preceding days, the patient said he couldn't remember. "It was very strange," he said. When asked where he was, he answered, "Psychiatric Clinic." (Since when?) "When you wander around so long, you don't know." The patient spoke spontaneously. He said when he was out at the private sanitarium, he saw two geese in a box. He also saw a dog with a muzzle. He could remember that exactly but didn't want to say any more about it. At 12.45 p. m. the patient was asked how he felt. He said he felt somewhat hungry, and somewhat stronger, but his heart hurt him. When asked about voices, he answered, "They are silent—only my conscience is not silent—Do you want to know?—I drank a glass of water and there was a fly in it and it said 'Thou shalt not kill,' so I crushed it. That was half an hour ago." At 1 p. m. the patient was given carbohydrates. Half an hour later the patient was perfectly quiet, lucid, and composed. In the afternoon, the patient was given 70 units of insulin, followed by carbohydrates two hours later. He was quiet and cooperative throughout the day and slept well at night.

November 18, 1934. (Ninth day of treatment.) The patient was given 60 units of insulin at 10 a. m., followed by carbohydrates at mid-day. He

was given no more insulin injections to-day because he showed a slight elevation of temperature (37.5° C.). The patient was quiet and well behaved all day, but was given a sedative at night before he fell asleep.

November 19, 1934. (Tenth day of treatment.) The patient was given 80 units of insulin at 6.30 a. m. He responded with profuse perspiration and somnolence and was given carbohydrates at 12.30. He was given two further doses of insulin of 70 units each at 2 p. m. and 6 p. m., followed by carbohydrates two hours laters. The patient was quiet and well behaved throughout the day and slept well at night.

November 20, 1934. (Eleventh day of treatment.) The patient was given 90 units of insulin at 7.15 a. m. He responded with perspiration and somnolence, and was given carbohydrates at 12.30. His behavior throughout the day was again quiet and composed.

November 21, 1934. (Twelfth day of treatment.) Patient was given 100 units of insulin at 6.30 a. m. At 11.30 a. m., the patient said he was terribly hungry. He asked the doctor to talk to him. He was absolutely clear, amiable, and responsive. When asked whether he felt completely well, the patient said, "Yes, I feel well, but not altogether. I am not as clear as I was yesterday. I just had an hallucination that men were coming out of that closet. It only lasted a short time, it's true, but I had the idea that men were walking in and out of the closet. I only realize now that it must have been an hallucination, because it certainly wasn't normal. How is that? I feel clear again now, but I'm terribly hungry. What's more, sometimes I get very frightened and I feel tense around the heart, which must have something to do with the strong hunger. I wonder if it's going to disappear when I eat. I am not at all sure that it doesn't come from a state of mind—." The patient continued to talk freely and described the paranoid episodes that he used to have months ago and which now come again sometimes after the injections. "I am not paranoid now any more—it's a funny thing, but I always used to feel the paranoid delusions coming on, even long before they were really there—I've noticed that when I smoke, that hungry feeling disappears for a while. This time I'd like a cigarette. But if you think it's bad, why of course I won't do it any more. I want to get well. I hope to be able to get back to work again—." A little later patient began to perspire profusely and grew more somnolent. At 12 o'clock, the patient was given carbohydrates and was quiet and amiable throughout the day, with no evidence of delusions or hallucinations.

November 22, 1934. (Thirteenth day of treatment.) The patient was given 110 units of insulin at 6 a. m., together with 15 gtt. Digipurat. He perspired profusely and grew sleepy, but awakened soon after and was again psychotic. At 12.30 p. m. he was given carbohydrates and the patient was quiet and composed for the rest of the day.

November 23, 1934. (Fourteenth day of treatment.) Patient was given 15 gtt. Digipurat twice to-day. He received 115 units of insulin at 6.30 a. m. At 11 a. m. the patient was perspiring profusely and grimacing. He appeared to be completely unresponsive to his surroundings. He had a fixed, vacant

gaze and did not respond to questions or commands. Soon afterwards, the patient grew quite disturbed, threw himself about the bed, and tossed his head from side to side, crying, "Where's Dr. S.?" (Dr. S. happened to be away.) (Do you want to speak to him?) "Yes." The patient perseverated and kept saying "yes" to all further questions. Finally, he grew comatose and somnolent. He lay perfectly quiet in bed, bathed completely in perspiration, with half-closed eyes. His eyes moved slowly from side to side, but more often turned upward. His pupils were somewhat contracted and fixed. The corneal reflex was absent on both sides. He showed a left facial weakness. The abdominal and cremasteric reflexes were elicited with difficulty. His extremities were limp and flaccid to passive movement. The deep reflexes could scarcely be elicited, but he showed a positive Babinski and Oppenheim on both sides, especially marked on the right. The patient was left in this condition until 1 p. m. His breathing at this time had become labored and stertorous. At 1 p. m. the shock was terminated by tube feeding. At 1.15 p. m. the patient was almost fully revived, and a few minutes later was able to give the following connected account of his sensations: "Well—first I perspired a lot—and the window was open, so that I was pretty cold. To keep myself alive (patient smiles at joke) I covered myself up. Then I got all sorts of thoughts—I didn't know whether to obey or disobey—then I thought—I suppose I'm insane—then I felt like shouting—that made me feel better—I felt like shouting and running around—then I thought to myself, 'A university man like you shouldn't holler like that'; then everybody around me said the same thing—then this fellow came with food and I had the same feeling you get before you go into narcosis—as if everything got mixed together in my head—then I started to curse—and when I cursed, I started to move around, and then I thought to myself I ought to write it all down—then I kept moving more and more—." Later on throughout the day the patient was perfectly quiet, composed and inconspicuous, free of hallucinations and delusions. He slept at night without sedatives.

November 24, 1934. (Fifteenth day of treatment.) The patient was given 120 units of insulin at 7.30 a. m. He perspired mildly at 10 a. m. and showed a tremor of the outstretched fingers. When questioned he said that he was sleepy. Soon after he grew more somnolent and finally went into coma. He was tube-fed at 2 p. m. Soon afterwards, the patient began to talk in a definitely childish way. "I'd like some milk and some sugar and some apple-sauce," he said. "Then my head will be clear again." Half an hour later the patient talked quite normally. He laughed and said it was all a funny business and he only wished he could remember what he had been talking about. He added that he was still "in a bit of a fog." When the patient was conducted to another bed, his gait was unsteady and atactic. "I'm still a bit shaky" the patient remarked. Later, the patient said he still felt rather tired, but that he felt better than yesterday. The patient was quiet and cooperative all day.

November 25, 1934. (Sixteenth day of treatment.) The patient was given 120 units of insulin at 7.30 a. m. He again went into a wet shock similar

to his reaction of the previous day and was given carbohydrates at 12.30. The patient developed a mild diarrhea in the course of the day and Tannalbin was prescribed.

November 26, 1934. (Seventeenth day of treatment.) The patient was given 120 units of insulin at 6.20 a. m. and the coma was terminated with a tube feeding at 12.30. He began to talk relatively soon after termination, and said he felt more confused than usual that morning after the injection, and that he had "atactic movements like in chorea." He also said that his muscles felt very relaxed and that he had the feeling that he was heavy. He added that he always had a headache after the insulin injections.

November 27, 1934. (Eighteenth day of treatment.) Patient was given 120 units of insulin at 8 a. m. He perspired profusely soon afterwards and he again became psychotic during hypoglycemia. At 10 o'clock, his speech was peculiar and affected: "A certain somebody desires to inform me and should inform me through the next patient that regarding the Roumanian oil-wells, I am —." Patient grew somnolent soon after and passed into coma. He was tube-fed at 12.30 p. m. The patient was perfectly quiet and composed throughout the afternoon. He remarked that he had a slight cold and said, "Well, Doctor, I was a little paranoid this morning, wasn't I?" During a long conversation involving medical and other subjects, the patient talked lucidly and freely, with no hint of any mental abnormality, and he calmly and confidently denied any paranoid ideas or hallucinations. When asked whether he was sick before, he answered clearly and calmly, "I believe I had paranoia."

November 28, 1934. (Nineteenth day of treatment.) The patient was given 120 units of insulin intramuscularly at 8.10 a. m. Hypoglycemia was terminated at 10.45, when the patient drank some sweetened milk without assistance. He was lucid and friendly throughout the day and slept well at night.

November 29, 1934. (Twentieth day of treatment.) The patient was given no insulin to-day. He was quiet and composed throughout the day and showed no mental symptoms.

November 30, 1934. (Twenty-first day of treatment.) The patient was given 120 units of insulin at 6.30 a. m., but showed no psychotic symptoms during hypoglycemia, and was fed at 11 a. m. He was quiet and composed throughout the day.

December 1, 1934. (Twenty-second day of treatment.) The patient was given 40 units of insulin at 7 a. m. He showed no marked physical reaction thereafter and was given carbohydrates at 10 a. m. At 6. p. m. he was given another 40 units, followed by carbohydrates at 8 p. m.

December 2, 1934. (Twenty-third day of treatment.) The patient was given no insulin to-day and was quiet and inconspicuous.

December 3, 1934. (Twenty-fourth day of treatment.) The patient was given 60 units of insulin at 5 a. m. He complained of strong hunger at 9 a. m. and at 10 o'clock told the examiner that he felt a little "foggy" after to-day's injection. He also said that last Saturday (December 1).

he felt some anxiety during the hypoglycemia, as if something was going wrong in the next bed, but he added that he was feeling all right to-day. The patient was fed at 10.30 and was calm and composed throughout the day. He showed no mental abnormality when examined.

December 4, 1934. (Twenty-fifth day of treatment.) The patient was given 40 units of insulin at 7.30 a. m. He perspired soon after and was fed at 10.30. At 11 o'clock he said that he felt frightened before he was fed to-day, and that he had the idea that he must have Addison's disease. "After eating, it all disappeared." Patient was given 25 units of insulin at 2.25 p. m. and was fed at 3.30. He was given another dose of 25 units at 6 p. m. and was fed at 7 p. m.

December 5, 1934. (Twenty-sixth day of treatment.) 25 units of insulin were injected at 9 a. m. and hypoglycemia was terminated at 10.30. Another 25 units were administered at 2 p. m., and the patient was allowed to eat one hour later. The patient was very happy to-day because of his improvement, and enjoyed a walk in the garden with his brother in the afternoon. He was given 25 units of insulin at 6 p. m., and ate again at 7.30.

December 6, 1934. (Twenty-seventh day of treatment.) The patient was given 25 units of insulin at 7.30 a. m. and was allowed to eat at 9.30. The patient said that he was again "foggy" after the injection and he thought that somebody was talking to another patient about him. The patient was given two further injections of 25 units each, followed by carbohydrates an hour and a half later. The patient was quiet and orderly throughout the day, without delusions or hallucinations, and slept well at night.

December 7, 1934. (Twenty-eighth day of treatment.) The patient was given 30 units of insulin three times to-day at 8 a. m., 2 p. m., and 6 p. m., respectively, followed in each case by carbohydrates an hour and a half or two hours later. He was quiet and composed all day, even during hypoglycemia.

December 8, 1934. (Twenty-ninth day of treatment.) Patient was given 30 units of insulin at 8 a. m. and expressed some mildly hypochondriacal ideas soon after. He said to the doctor, "Am I really well?" He was given carbohydrates at 9.30 and was given two further injections of insulin of 30 units each in the early and late afternoon, followed in each case by carbohydrates an hour and a half later. The patient was quiet and inconspicuous all day, and slept well at night.

December 9, 1934. (Thirtieth day of treatment.) The patient was given no insulin to-day. He was quiet and friendly, talked and walked with visitors, and slept well at night.

December 10, 1934. (Thirty-first day of treatment.) The patient was given 25 units of insulin three times to-day, followed by carbohydrates an hour and a half later.

December 11, 1934. (Thirty-second day of treatment.) The patient was transferred to the quiet ward for the first time. He was given 15 units of insulin three times to-day and the hypoglycemia was terminated after an hour and a half. The patient behaved well all day and slept comfortably at night.

December 12, 1934. (Thirty-third day of treatment.) The patient was again given 15 units of insulin three times to-day, followed an hour and a half later by carbohydrates. He showed no physical reaction and no psychotic symptoms or hypochondriacal ideas during hypoglycemia. The patient was quiet and helped with the ward routine. He was allowed to take walks, and was altogether cooperative and inconspicuous.

December 13, 1934. (Thirty-fourth day of treatment.) The patient was given no insulin to-day. He showed no symptoms and enjoyed a walk.

December 14 to December 17, 1934. The patient was given no insulin throughout this period. He was allowed to leave the hospital for a few hours at a time. He read newspapers and books. He was friendly to physicians and attendants, and helped around the wards.

December 18, 1934. The patient was given his final examination to-day. He was perfectly clear, calm, friendly, and composed. He said himself that he realized very well that he had paranoid ideas and hallucinations. He remembered that he thought he was being given poison gas. He heard voices then and he could not think straight. He had an awful feeling that everything was disconnected. Now the feeling was completely gone; it wasn't pleasant to talk about. The patient's wife declared that since early in December he seemed to her to be himself again. In fact, she added, he seemed to be even better than he was before the outbreak of the psychosis, for he had been depressed and inhibited for a long time; but he now seemed happy, unrestrained, quiet, and solid. The Klinik officially declared him to be fit to resume his professional duties.

In July, 1935, the patient was still successfully engaged at his former work, without symptom or complaint.

In September, 1936, he was still satisfactorily fulfilling his professional duties.

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CHOREA GRAVIDARUM.

A Study of Psychogenic Factors Therein, with Report of a Case.*

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Chorea associated with pregnancy constitutes an exceedingly rare obstetrical complication, statistics as to its frequency varying from 1 to 20,000 to 1 in 3500 pregnancies. Although known since first described by Horstius,[1] in 1860, much difference of opinion has existed, and still does exist, as to its nature. In general, two views prevail: One, that it is infectious and rheumatic in nature; the other, that it is, instead, dependent upon pregnancy for its production.

The proponents of the rheumatic-infectious theory point out as significant the frequency with which there occurs a history of previous rheumatism or chorea. Willson and Preece,[2] in a recent statistical study of practically all the cases thus far reported in the literature, found such a history of previous rheumatism in 35 per cent of cases, and of previous chorea in 61 per cent. They found, also, that acute and recent endocarditis was present in 86 per cent of those cases that came to autopsy. Other investigators, as Mackey,[3] Quigley,[4] and Birnbaum,[5] concurring in the belief that the condition is of infectious origin, point out that bacteria, mostly streptococci, as well as small cerebral emboli from endocarditic processes are often found in the brain. From the foregoing rather conclusive evidence, it would seem that an infectious-rheumatic factor is operative in a certain number of cases at least.

Opposing the infectious theory are such writers as Shaw,[6] Harding,[7] Pinard,[8] Sanger,[9] and Rich,[10] who believe the condition to arise from toxic factors relating to pregnancy. These writers point out that chorea of pregnancy appears at an age when simple chorea is exceedingly rare; that it lasts much longer; that it disappears

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very frequently after the uterus is emptied; and that it rarely extends beyond the puerperium. These facts they interpret as evidence of a uterine origin of the disease. Shaw,[6] after successfully treating 32 consecutive cases solely by rest and eliminative methods, concluded that the cause was a toxemia acting upon an irritable and unstable nervous system. The proponents of the toxic theory, however, have little pathologic evidence to support their view. They have yet to explain why the pathological changes found in other toxemias of pregnancy—*viz.*, degenerative changes in liver, kidneys and heart—are rarely found in chorea gravidarum. The toxic theory seems to be presumptively based upon the absence in many cases of any history of previous chorea or rheumatism, or any evidence of endocardial disease, together with the fact that very often the condition clears up promptly after the uterus is emptied.

That psychogenic factors may play an etiological rôle has been suggested by but relatively few writers. Hocquet,[11] in 1888, departing from both the infectious and toxic theories, expressed the opinion that hysteria and chorea (of pregnancy) would appear to be but two forms of the same malady. More recently, Whittemore,[12] in 1926, expressed the opinion that certain cases are neuroses, and that the heightened emotionalism of pregnancy, coupled with fatigue, may so react upon an individual of neurotic make-up as to precipitate chorea. It is with an evaluation of the possibility that psychogenic factors may play a major etiological rôle in certain cases that this presentation is chiefly concerned. With this in mind, it is proposed that a study of the reported cases be undertaken, and to group together those in which there seems to be psychogenic coloring, testing, in the end, the validity of the infectious-rheumatic theory as it may apply to this special group.

First to be considered, as possessing certain psychogenic color, is that group of cases in which recovery immediately followed abortion. The very acute and spectacular termination in these cases mitigates consideration of an infectious etiology. Instead, such a course of events suggests psychogenesis. This is better appreciated when one realizes that chorea gravidarum is essentially an affection of young women who are pregnant for the first time, and at an average age considerably less than that of a control series. In approximately 17 per cent of the reported cases, the pregnancy was

illegitimate. Of the cases hereinafter to be considered psychogenic, approximately 50 per cent developed during the second trimester, the peak being reached in the fifth month—or at the time when quickening and other positive signs of pregnancy remove all doubt as to the significance of missed menstrual periods. Thus, it would appear that the cases in which psychogenesis is suspected developed at the time when women, tender in years, were compelled to face for the first time the problem of childbearing with all its fears, social implications, and after-responsibilities. That this situation, in certain individuals of poor psychological endowment, may precipitate emotional conflict of major proportions can be appreciated. If, as has been suggested by Whittemore [12] and Hocquet,[11] choreiform behavior can be an expression of psychic conflict, termination of the conflict by abortion might explain the very dramatic cures that follow that procedure.

Some of the reported cases appear to have been spectacularly cured not by abortion, but by dramatic therapy instead. Flamma,[13] for example, reported an immediate cure following a sham abortion; Hubert,[14] a case in which prompt recovery followed a dilatation of the cervix; Buist,[15] a case attributed to dyspareunia, which ceased promptly after the hymen was incised, and another in which cure was effected by the removal of an urethral caruncle; Albrecht,[16] in 1915, reported a prompt cure following the injection of serum from a normally pregnant woman. Although this form of therapy has since been tried by others, results have been negative. It is obvious that these cases could have been neither infectious nor toxic in type. It is equally obvious that the methods of treatment employed were dramatic and replete with suggestion.

The frequency with which chorea gravidarum is precipitated by fright, anger, or some other type of sudden emotional experience, is too great to be considered as merely of passing interest. Reports of approximately 70 such instances occur in the literature. Mosler,[17] in 1862, reported a case that developed after a fall into water; Hand,[18] in 1807, reported a case that followed a fall from a ladder; Bamberg,[19] in 1873, reported a case of a woman who was awakened at night by the crackling noise of a fire in her home, and who, the next day, was suddenly stricken by violent twitchings. That acute and severe emotional traumata can act as precipitants of neuroses is a generally accepted psycho-pathological fact, and it would seem

that in those cases where, in the course of a few hours or days, chorea follows such acute emotional experiences, psychogenic, rather than infectious, factors should be suspected. It is possible, of course, that emotional tension, with its accompanying physical fatigue, may over a period of time so reduce physical stamina as to allow dormant infection to light up, or to so disrupt the body economy as to produce metabolic toxins; but, that this can occur in the brief course of a few hours or days following an acute emotional experience is difficult to comprehend. In such cases, the more reasonable hypothesis would be that the emotional shock so disturbs psychosomatic integrity as to precipitate certain constitutional tendencies which, expressed, make for choreiform behavior. For these reasons, it is suggested that those cases which developed acutely following emotional stresses be considered tentatively as belonging to the " psychogenic " group.

That pregnancy can, in certain psychological types, be productive of sufficient emotional stress and conflict to cause psychoses which are purely functional in pattern, psychogenically conditioned, and independent of the physical hazards of infection, toxicity and general strain, has been commented upon by such writers as Pilcz,[20] Zilboorg,[21] Saunders,[22] Frumkes,[23] and others. Most interesting in this connection would be a statistical study of the psychoses that occur in chorea gravidarum to determine whether or not there exists the same predominance of functional over organic patterns as is found in psychoses generally associated with childbearing. If the toxic-infectious theory is correct, one should reasonably expect organically patterned mental reactions, instead, to predominate. Such a study cannot at the present time, however, be accurately made, inasmuch as the majority of the psychoses reported are so poorly described, or described not at all, that classification according to modern nomenclature is impossible. In passing, it may be said, however, that, of the 50 psychoses mentioned, organically patterned reactions are reasonably well described in only seven instances. Among the remainder are a few cases undoubtedly schizophrenic in nature, while the most frequently mentioned reaction was that of excitement referred to as " mania." Only careful future study of the mental states associated with chorea gravidarum will answer the interesting question as to which patterns of reaction predominate—the organic or the psychogenic.

In spite of our inability to determine definitely what types of psychoses predominate in chorea gravidarum, a study of those 50 cases in which a psychosis did occur may shed some light as to possible psychogenic factors involved. Such a study reveals that many of the psychoses developed in the absence of any signs of infection and toxicity, and that in many instances where the chorea was undoubtedly on a toxic-infectious basis, with high temperature, albuminuria and endocarditis, there was no associated psychosis. From these facts, and in keeping with the established psycho-pathological principle that susceptibility to mental disorder varies inversely with the fundamental stability of the personality, it would seem that those individuals who developed psychoses represent a group whose fundamental stability was less than that of those remaining members of the series who, throughout their illnesses, maintained mental equilibrium. To correlate, if possible, this fundamental instability with the genesis of chorea gravidarum, it is proposed that this psychotic group be considered as one in which psychogenic factors may exist.

If one now tabulates those cases which, from previous discussion, seem to possess certain psychogenic color—namely, those cured spectacularly after dramatic therapy; those in which recovery very promptly followed abortion; those that were precipitated by acute emotional traumata; and those in which psychoses occurred—one has a group of 137 cases. Let us now proceed to examine the applicability of the infectious-rheumatic theory to this group. The proponents of this theory point out as significant the frequency with which a history of previous chorea and rheumatism occurs. If, in this special group, the suspected psychogenic factors are of no significance, one would logically expect that the incidence of previous chorea and rheumatism would be the same as for those remaining cases in which psychogenic color is absent. Conversely, if the psychogenic suggestions are significant, one should find in these cases less of that evidence upon which the infectious-rheumatic theory is based.

Let us inquire into this point. Willson and Preece,[2] in their statistical study, found a history of previous chorea in 61 per cent of cases. In the "psychogenic" group, such a history is found in only 29 per cent of cases. Likewise, a history of previous rheumatism, which they found in 35 per cent of cases, is present in only

17 per cent in the "psychogenic" group. Figures as to the incidence of cardiac disease are even more striking—40 per cent in the former group, and only 13 per cent in the latter. It appears, therefore, from these statistics, that in those cases where there is some evidence of psychogenesis, there is a singular weakness of that evidence upon which the infectious-rheumatic theory is based.

From the foregoing, it would not seem, as has been contended by many writers, that chorea gravidarum is an entity, representing rheumatic infection precipitated or reactivated by the special stresses and strains of pregnancy. There is irrefutable evidence that many cases are of that nature, but that all are on that basis is open to question in view of the evidence at hand. Its precipitation by a variety of factors—infectious, toxic and psychogenic—indicates that some common factor is involved, and suggests that it is a symptom complex, rather than a disease. [In scientific nomenclature, it would probably be better to speak of "Choreiform Behavior In Pregnancy."] To call that common factor, which, precipitated, makes for choreiform behavior, a neuropathic diathesis is admittedly vague; but such a concept is justified if it serves to direct attention upon the variety of factors involved in its precipitation and expression. Only thusly viewed can the problem be studied with hope of solution. At present, in spite of progress in cerebral physiology, pathology, metabolism and experimental biochemistry, the real nature of the mechanisms by which constitutional tendencies are precipitated and expressed is still very much in the dark.

In the following hitherto unreported case, one sees choreic tendencies precipitated in the same individual on two different occasions—once by infection, and again by psychic conflict relating to pregnancy.

Case Report.

M. G. was first admitted to Butler Hospital at the age of 16, for chorea associated with a psychosis. Previous history was negative for chorea and rheumatism. Six weeks previously, patient had had a severe attack of tonsillitis, followed by choreiform behavior and a psychosis, in which patient was depressed, entertaining delusions of sin, contamination, unworthiness and death. After two weeks of hospitalization, during which time her behavior was typically choreiform, improvement began and, with it, the mental symptoms subsided. Patient left the hospital five weeks after admission, all symptoms of chorea gone and mental state clear.

When 21 years old, patient was re-admitted for choreiform behavior associated with pregnancy. The interval history revealed that she had done well following the first attack, had graduated from high school, married into a family of some means, had borne one child without there being at any time any suggestion of a return of chorea. During the previous year, however, misfortune and hardship had been her lot. Her husband had lost his job; his family had lost their money; and for months patient had struggled to make ends meet with what little she received from relief agencies. To make matters worse, her husband had taken to drink, and two months previously had been arrested for drunken driving. At about this same time, patient missed her period and, concluding that she was pregnant, went to several physicians and clinics, requesting abortion and giving as her reason that she was going to have chorea. Being told that, inasmuch as she showed no symptoms, her request could not be entertained, patient became depressed. Gradually thereafter choreiform symptoms developed, finally assuming such proportions that hospitalization was necessary. Physical examination revealed patient to be well nourished and in good general health. Temperature, pulse and laboratory studies of blood and spinal fluid were normal. Neurological examination revealed the knee jerks to be pendular, adiadokokinesis was present, and the pronator sign was positive on the left. Within 48 hours after admission, movements became so general as to involve nearly all the voluntary musculature of the body, and so violent that the patient was in constant and extreme motion, twisting, turning, smashing her head against the bed, her hands hitting and bruising her face, and, if it were not for constant nursing attendance, the patient would on many occasions have catapulted herself onto the floor. Speech was inarticulate. There was grimacing, gnashing of teeth, and biting of tongue and lips. To adequately describe the severity of the picture is impossible. To those who witnessed it, it left an indelible impression. Members of the resident and consulting staffs were agreed that the severity of the condition, and the patient's rapidly developing exhaustion, warranted a termination of the pregnancy. Inasmuch as in the beginning, and before any choreiform behavior had developed, patient had suggested to herself and others that, unless aborted, she would have chorea, the presence of a strong psychogenic element in the case was suspected. It was, therefore, decided to try strong counter-suggestion, and patient was told that termination of the pregnancy might not be possible until the chorea had subsided. Within 24 hours, there was such a dramatic change that careful examination was necessary to detect what slight vestiges of chorea still remained. At this point, psychotherapy aimed at adjusting the patient to the reality of her pregnancy was attempted, but to no avail, for gradually the previous picture reurned. Because of the severity of the picture, increasing exhaustion and climbing pulse, it was then decided to proceed with a therapeutic abortion. The cervix was dilated and a rectal tube inserted. This was followed by an immediate cessation of the choreiform behavior. When, in 24 hours, expulsion of the fetus did not occur, patient became depressed, expressing doubt as to the sincerity of her medical

attendants, and choreiform behavior returned. At this point, a Voorhees bag was inserted, and 12 hours later the fetus was expelled. Her reaction was one of relief and ecstasy. She stated that it was the pregnancy which caused her illness and that now she would be well, and indeed she was, for after an uneventful 10 days in bed, during which time no choreiform behavior was present, she was up and about, engaging without any difficulty whatsoever in fine needlework and playing the piano. Subsequent convalescence was uneventful, except on one occasion when patient learned that her husband had left her for parts unknown. At that time, there was a return of slight chorea limited to the left arm, which the patient, herself, suggested might be related to the fact that it was on that hand that her wedding ring rested.

From the foregoing, it may be suspected that the condition was hysteria, and not true chorea. For hysteria to produce such a violent picture, in which innumerable bodily injuries were sustained, is difficult to comprehend. Pure hysteria would also hardly explain the hypotonus, with pendular knee jerks and positive pronator sign present in this case—signs ordinarily associated with genuine chorea.

Summary.

Approximately 950 cases of chorea occurring in pregnancy have been studied statistically, to determine what part psychogenic factors may play in its production. Of these, 137 seem to possess evidence of psychogenesis and in these cases, the incidence of previous chorea, rheumatism and cardiac disease is significantly less than in those cases where evidence of psychogenesis is lacking. These findings suggest that chorea gravidarum should not be regarded as an entity, but instead as an expression of a constitutional "anlage" which may be precipitated by various factors. Such factors may be infection, toxicity, or nervous influence originating from acute emotional traumata and psychic conflict relating to pregnancy. A case is reported in which two attacks of chorea are described—the first following an acute infection of the rheumatic type—the second being associated with great conflict relating to pregnancy.

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DISCUSSION.

DR. WARREN G. MURRAY (Dixon, Ill.).—There seems to be a bit of irony in asking a superintendent of a feebleminded institution to discuss chorea gravidarum, since no cases have been reported in twenty thousand deliveries from the Rotunda Hospital, the largest maternity hospital in the United Kingdom. I believe that I had seen, until the time I was asked to discuss the paper, only one case. This case, committed as an epileptic, had had chorea for

an unknown period before commitment and we suspected the possibility of myoclonus epilepticus. She went to term with her first child and the choreic movements subsided about six weeks after delivery. The child died from icterus at the age of five weeks. After the choreic movements ceased the woman was in the hospital about a month longer and was paroled. Two years later she again entered the hospital with almost the same history, but did not go to term. She aborted at six months, after which there was again a gradual diminution of the choreic movements. She was again paroled. She entered the institution again immediately after she became pregnant. This time there were no choreiform movements, but she aborted at three months. During this pregnancy there was no evidence of the jerky movements of pregnancy. I tried to find other cases and was fortunate in finding one, at Cook County Hospital, Chicago, on April 4, 1936. She gave this history: About a week before she was admitted to the hospital there was a history of fright, after which the choreiform movements started. She was immediately taken to the hospital. The mental picture was that of extreme restlessness and clouding. Her maximum temperature was a hundred and two and four-tenths; her maximum respiration was 46; and I think her pulse ran up as high as 140 at about the time she delivered.

On the day preceding delivery her blood count showed 15,000 white cells and 4,800,000 red cells, but I saw her on the day after delivery. They stated that the clouding and the restlessness had been markedly reduced during the preceding three days.

This picture was vastly different from the one that we had at the institution. We felt that there was a marked neurotic element in the institutional case, whereas in the other case the obstetricians felt, at least, that there was a marked organic trouble. I think as early as 1701 Newell stated that in England chorea gravidarum was recognized and held as a neurosis; and as such I certainly feel that psychotherapy can and would be of considerable benefit.

There was another case which has not been recorded in the literature, I am quite sure, a case of which Dr. George F. Dick, the head of the Department of Medicine of Chicago University, wrote me. He stated that he had examined this case and she had given a previous history of rheumatism on two occasions. She was also seven months pregnant, as was the case I saw at the Cook County Hospital. The choreic movements lasted longer, I believe, in Dr. Dick's case, than in the one that we had, or the one in Cook County, but I see absolutely no reason why a psychogenic origin should not be considered in chorea gravidarum.

Dr. Charles P. Fitzpatrick (Providence, R. I.).—I was very interested in Dr. Weigner's presentation of this case. I have felt for quite a long time, particularly in second attacks of chorea, that there was a very large psychogenic element in many cases. We know, of course, that emotional tension of one sort or another has a decided tendency to drain over into established neuro channels. In other words, that you may have a neuro channel established by definite organic infection, and then have the same picture produced

from any cause later on, whether it be psychogenetic or not. I never thought particularly that this tendency was constitutional, as Dr. Weigner intimated. I always thought it represented something which had been facilitated by a previous attack. I would like to ask him just how he explains the constitutional tendency which will give you hypertonus on the left side and not very much on the right, and very marked pendular knee jerk on that side with a pronator sign, which is a very marked characteristic. Does he think that is an evidence of previous channels or that it is an expression of constitutional disturbance, a fundamental and inherent difficulty?

Dr. Francis J. Gerty (Chicago).—I have been much interested in Dr. Weigner's presentation and wish to briefly add to the report one case which I think parallels his case. In August of last year a young woman, twenty-seven years of age, then in her fifth month of pregnancy, was brought into the Cook County Psychopathic Hospital. The choreiform movements were very marked, locomotion was almost impossible, and it was with great difficulty that she managed to speak so that the history could be obtained from her. Her body was much bruised from having fallen repeatedly.

The history was that she married in December of 1934, and became pregnant in February of 1935. At the sixth week of pregnancy she began to show the choreiform movements which increased in severity up to the time I saw her in August. She was given sodium amytal intravenously immediately on arrival at the hospital, and secured some sleep. Movements were present when she awoke. After that some chloral hydrate was used on one or two occasions. However, when she realized she was in the psychopathic hospital and the situation became quite apparent to her, the movements gradually subsided, but did not disappear. However, she improved sufficiently to be discharged from the hospital. Her sister gave us some history on the case. Two aunts, sisters of the father of the patient, each had two pregnancies during which similar movements had been observed. The movements disappeared entirely after delivery of children at full term. Therefore the sister was not greatly concerned about our patient. She felt she would get well, even though the symptoms seemed alarming. When the patient was in high school, she had had difficulty in getting through some of her courses, and felt that one of the instructors was not fair to her. This resulted in what was termed a nervous breakdown. At the same time she had an infected tooth. The family sent her out West; the nervousness cleared up. She also had two other symptoms that might indicate an hysterical individual. One was that on several occasions, for a period of two or three days, she had lost her voice. The second symptom was that she had suffered from night blindness at times for two years.

The physio-neurological and serological examinations in this case were negative except for the movements. She went on to term, having practically no trouble throughout the rest of the pregnancy except that sometimes the choreiform movements could be seen. She delivered a live child on the 14th of January, 1936, and has been well since.

DR. E. I. FALSTEIN (Elgin, Ill.).—I was one of Dr. Gerty's associates in the work completed at the Michael Reese Hospital and quoted by Dr. Weigner in his summary of our results. It requires no further reviewing, except to reiterate that we found the psychogenic element prominent in 150 cases of Sydenham's Chorea, with emotional disturbances often the only apparent etiological factor.

A case of acute chorea was admitted to the Elgin State Hospital last year. Necropsy revealed a six weeks twin pregnancy. The brain is being worked up pathologically by Dr. Weil at Northwestern University. Grossly, it is asymmetrical, with the left hemisphere smaller than the right. A frontal section through the corpus striatum reveals the basal ganglia on the right side more caudad than the corresponding portion on the left.

In Dr. Weil's text on neuropathology, he quotes Bing's concepts of a defective anlage in the striatum and its importance in predisposing to these choreic disorders when toxic, infectious, or emotional trauma is superimposed. This theory seems to be quite a reasonable one.

In London last summer, at the meeting of the International Neurological Association, Dr. Theodore T. Stone and I presented a pathological study of a third form of chorea, namely, Huntington's Chorea. Even in those cases, where the pathology can be readily demonstrated, one often finds a strong functional element.

I thought it would be of interest to add what appears to be another case of chorea gravidarum, that, grossly at least, presents a strongly suspicious pathological factor. If it isn't too late, I would like to ask about pathological studies which have been made in chorea gravidarum.

DR. WALTER C. WEIGNER (Providence, R. I.).—I wish to thank the discussants for their reports of additional cases.

In my paper, I inferred that the rather orthodox concept of chorea as being always an expression of rheumatic infection, or at least chronic streptococcic infection, is not correct. This feeling has developed in the other branches of medicine during the past two years. Dr. Gerty, with his associates, in 1935, after a seven-year study of one hundred and fifty children with chorea, came to exactly the same conclusion. He found some very interesting data. He used as a control series a group of cases of unquestioned rheumatic heart disease, and he found the whole set-up to be different. He found, in the first place, that those children who developed chorea came from families in which there was a great deal of emotional instability, in which there was a great deal of social maladjustment, in which there was a great deal of excessive emotional turmoil. This history he did not find in those children who had uncomplicated rheumatic fever.

He found, also, that those children who developed chorea possessed a certain personality make-up which he subsequently termed "the choreic temperament." The children who developed chorea, he found, were brilliant and highly intelligent, but rather high-strung in nature, and at the same time rather introverted. He found, also, that practically all the children who developed chorea, with the exception of three, had considerable evidence of

social maladjustment in school, at home, and in the community; and this, again, he did not find in the children who had uncomplicated rheumatic fever.

As to heart lesions, he found a certain percentage of those children who developed chorea had heart lesions, but those heart lesions disappeared by the time the chorea disappeared, and did not at all run a course similar to those cases which had unquestioned rheumatic fever.

Other investigators in the laboratory have discovered recently that in rheumatic fever the sedimentation time of the blood is rapid, and in chorea it is normal. These investigators, Gerty and his associates, have therefore concluded that there is a general factor behind these manifestations, and that this factor can be precipitated by a variety of conditions—some infectious, some toxic, and some purely psychogenic.

As to Dr. Fitzpatrick's question—namely, whether the pronator sign and the hypotonus are residuals of the previous attack of chorea, or an expression of a constitutional factor, I am sure I do not know. I rather suspect, however, that those patterns of reaction were laid down with the first attack of chorea. Solly (?) has pointed out that movements of the fetus are choreiform in nature, and that muscle movements only become orderly and purposeful after birth; and he suggests that perhaps this constitutional tendency is an expression of a failure of normal development.

SPEECH AS EMERGENT SPECIFICITY.*

By JOHN HENRY MUYSKENS, Sc. D.
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In the course of the centuries, man's conception of the nature of language has passed successively through four stages. Primitive man had a theological view (so to speak) of language. Language was a fiat creation of God, who bestowed it upon man at his origin. Many such primitive men still exist, some even in our higher educational institutions. This was followed by a period which may be designated as symbolic. Words represent ideas, the character of which is logically determined. This mode of thought prevailed in the west from the days of the Hellenistic Greeks to modern times and still influences many students of language. The third stage, which is at present the dominating one, conceives of language forms as mainly determined by the mental process. This is the psychological period. More progressive modern students prefer to designate their study of language as biolinguistics, on the basis that language is actually a biological process, the characteristics and phenomena of which are determined by the integration of the forces of the body with each other and with the forces of the environment. The last point of view is represented in the present paper.

Viewed from the biological angle, language, and in particular speech, must be regarded as a highly specific emergence from and conditioning of certain vegetative processes of the organism. For purposes of diagnostics and therapeutics, it is necessary to consider how far inherited characteristics enter into each given case, and it is useful to distinguish between two phases of this development: (a) the embryological stage, and (b) parturition and the postnatal development, and to give particular attention to the earlier stages of period (b), in which the developmental processes of speech proceed more rapidly than later.

During the embryological stage, the integrational processes develop rapidly and during this period many deviations from the normal forms of development occur. These range from monstrosi-

* Read at the ninety-second annual meeting of The American Psychiatric Association, St. Louis, Mo., May 4-8, 1936.

ties to scarcely noticeable deviations. Unfavorable conditions affecting the nutrition and health of the mother may result in more or less serious deficiencies of speech in the offspring. Here a preventative program is needed, including clinics for the care of the mother in the prenatal period. The incidence of speech defects resulting from injuries to the child during parturition might be materially reduced in seriousness and number by more attention to the care of the mother during gestation. There is a high frequency of instrumental births, and though the damage from instruments has been overestimated, it is desirable to have all primiparae cared for under the most perfect hospital conditions.

Already previous to birth there has been considerable integration of muscular movement of the chest and back and shoulder girdle involved in breathing. The mechanism of breathing is ready to function within half a minute of birth and usually does so function 35 seconds after the clamping of the cord. Any delay in breathing is already a sufficient cause for much disturbance in the rhythm of breathing and heart beat which will later on show up as a more or less serious disturbance of speech. Special care should also be taken to insure correct suckling habits, since the vowel system is a product (modification) of the swallowing and sucking processes. If these processes are rendered abnormal by nasal obstruction, by bottle feeding or otherwise, speech defects are bound to develop. A very beneficial grouping for sentence structure results from integration of the child with the mother, promoting the orientation movements needed for synergy in the speech movements. The first nine months are a very critical period for the development of the vowels and a few of the occlusions, though few of the constrictive consonants appear before the eruption of the teeth.

Thus, little by little, up to the third year, all of the specificity of sorting out of the muscle functions serving the vegetative needs of the body takes place. This, from our point of view, involves the unfolding of melody and rhythm, accent, vowels, and consonants, each in its turn.

The next three years are marked by the fixing and perfecting of these patterns as motor components integrating with the developing sensory equipment. Of this period in normal children, a very detailed study was made by Dr. Irene Poole Davis at the University of Michigan. She shows clearly that the child soon learns to hear

the pattern it can make, thus making a sensory motor connection which does not break down easily. She found that considerable damage to the frictional consonantal system results from six to seven years of age due to the replacing of the deciduous teeth by the permanent. This entire series of developing structures and processes gives us a scale of the increasing complexity, which from the point of view of the diagnostician is of considerable importance in determining the history of a particular interference. (1) Preparturitional unfolding results in the rhythmo-melodic frame of language. Preparturitional disturbances thus prevent or interfere with the whole system of specificity. (2) The next nine months add integration of sucking and swallowing and the sorting out of movements of valving in the larynx, which form the basis of accent, vowels and some of the consonants. The incidence of common respiratory ailments interferes with the development of the specificity of these elements of speech. (3) The following two years are marked by the fixing of the relation between the sensory (particularly the auditory) process and the muscular movements. (4) With the eruption of the teeth comes the difficult and delicate differentiation between the fricative consonants.

The kind of speech difficulty that results from pathological conditions during this entire formative period will therefore be determined, not by the kind of disease, but by the time at which it occurs. The temporal boundaries of this unfolding vary greatly with the degree of precocity or of retardation of the subject, due mainly to favorable or unfavorable conditions of metabolism. When once a given function has failed to develop at its proper time and in its normal sequence in the chain of developing processes, it becomes very difficult to bring about the unfolding of that process at a later time. One often finds speech defective children in whom thorough medical examination reveals no present lesion, who, nevertheless, will never develop a normal speech unless given special aid and attention. The process is rather one of fractional emergence, which results in a large amount of contamination. The earlier the incidence of the disturbance in the series of developing processes, the more extensive the contamination, and the rehabilitation must in all cases begin with the earliest of the disturbed processes and proceed successively through the subsequent contaminated stages.

The concomitant semantic disturbances, which are commonly spoken of as functional components of personality, oftentimes remain in abeyance until the above described physiological integrations have been attained.

It would seem accordingly that rehabilitation of fractional speech and the care and training of the mentally retarded coincide. Dr. Thorlief Hegge, Director of the Research Department of the Wayne County Training School gave Miss Mary Helen Meader, a graduate student at the University of Michigan, an opportunity to study this subject. She is now completing a doctoral dissertation based upon the study of the physiological determinants of cases of fractional speech occurring in this institution.* In order to avoid the complications of adolescence, all children over 13½ years of age were rejected from Miss Meader's study. The study when completed will consist of:

1. Study of 168 cases of children showing fractional speech. A detailed analysis of (a) case histories, (b) medical examinations on admission.

2. For purposes of comparison, a similar study was made of (a) a group of cases showing I. Q. 59 and less; (b) a group of cases showing I. Q. 75 and over; (c) a control group of cases showing no noticeable speech defects.

3. To these were added data concerning a group of normal children from Highland Park, Michigan, having speech defects.

4. (a) A differential blood count of three groups:

   i. Fifty speech cases from Wayne County Training School.
   ii. Fifty non-speech cases from Wayne County Training School.
   iii. Fifty normal children.

(b) A study of respiratory-cardiac rhythms of the above groups from objective (kymograph) records.

* This work is greatly facilitated by the constant friendly cooperation of the staff, in particular of Dr. Robert Haskell, Dr. Thorlief Hegge and Dr. A. H. Steel. This is an institution to which mentally retarded children of school age may be committeed through Probate Court order for one or more years. These children are for the most part of such a type as may be returned eventually to the community in the expectation that they will make a reasonable social and economic readjustment. During their residence they are submitted to a well-organized program of educational, psychological and medical care.

(c) Dental matrices for determining character of occlusions and palates.

While the study is not yet ready for publication, it is possible to report the following striking results:

I. Of 171 children under 13½ years of age in the institution, 34 per cent were reported as having defective speech. Experience shows that this is considerably lower than the actual percentage. It is observed in the department of special education in Highland Park that only a small fraction of the retarded children less than 10 years old showed normal speech development. Some showed "recovery" after this age.

II. A cursory study of the data sheets compiled from the case histories and medical examinations shows that these children are as a group "sick" and markedly inferior both physically and physiologically to the normal population. It appears that the lower I. Q. group shows as a group a definitely greater deviation from the norm than the higher I. Q. group. It is at present possible to say only that, as far as accurate temporal histories are available, the fractional speech group differs from the others in that specific disturbances occur at critical periods in the time frame. Deviations of certain types are apparently specific predisposing factors to fractional speech. Among these are such disturbances as may produce running ear, restricted breathing passages, and disorders of the nervous system, such as epilepsy, chorea, and spastic paralysis.

III. There are available 125 reasonably complete developmental histories (prepared by trained social workers). A study of these shows only a very few cases free from serious illnesses and developmental anomalies—premature birth, convulsions and other serious disturbances during infancy and a very high incidence of contagious diseases during early childhood.

IV. The data contained in the medical examination given by the staff physician at the time of the child's admission were carefully tabulated and correlated. Some of the more interesting findings are as follows:

(a) Blood pressure — diastole 40 to 90 mm. Hg.
Blood pressure — systole 76 to 136 mm. Hg.
Pulse pressure — 16 to 72 mm. Hg.
Average pulse pressure is high.

Grouping of the blood pressure figures for the group shows a tendency for the extremes of pulse pressure to coincide with the extremes of the diastolic curve. The mean pulse pressure for the group is significantly higher than that given in the literature for the normal population.

Fourteen per cent show systolic murmurs (the usual incidence in children is 4 or 5 per cent).

(b) Fifty per cent have some deviation from the normal in thyroid, pituitary or gonadal development or function. Sixteen per cent were diagnosed as definite endocrin pathologies, involving pituitary or thyroid hypo-function. Half of this number were so diagnosed by specialists, the balance by the staff physician.

(c) Chorea and epilepsy are also of frequent occurrence. (Serious cases of epilepsy are not ordinarily accepted by this institution.)

One rather unexpected result of particular interest was the prevalence of hypertrophied turbinates. Over one-third of these children are so diagnosed, many of them qualified by such adjectives as "markedly," "enormously," "total obstructive." A fact of interest to physicians in this connection is that in about half of these cases a tonsillectomy had already been performed. There appears to be a very high correlation between hypertrophied turbinates and deviations from the norm in blood and pulse pressure. Eighty-six per cent fall on the extremes of the diastolic blood pressure curve. Apparently the restricted breathing space resulting in disturbed respiration and lowered oxygen intake has a direct relationship to the circulatory functions.

The facts just mentioned are suggestive of a high degree of correlation between physiological conditions and the mental and physical (nervous, muscular, glandular) processes of speech. This suggests a reciprocal relationship between the mental and physical factors, if not their identity. While the above results cannot of course be regarded as conclusive, since the number of cases involved, though large, is nevertheless somewhat limited, they may be tentatively accepted and inspire further investigations along the same lines.

DISCUSSION.

DR. WILLIAM MALAMUD (Iowa City, Iowa).—I am sorry that I came in towards the end of the paper and didn't hear the whole presentation. I am very much interested in this work, especially since at Iowa City we have an

elaborate set-up for working with speech disturbances of which Dr. Muyskens probably knows. Dr. Travis and I have been associated on some of the research work in these disturbances.

I wish to stress particularly my agreement with the speaker's last words. In a study that Dr. Travis and I undertook on the physical makeup of stutterers, we found a high correlation between the type of physical build and stuttering. We found that stuttering occurred most frequently in persons of an asthenic or asthenic-athletic makeup physically and of a distinctly introverted schizoid or schizothymic type of personality. We found very few pyknic stutterers.

Another correlation of a physiological type in stuttering is the one that Dr. Travis spoke of yesterday afternoon when he presented the results of some of our work on electro-encephalography in normal persons, stutterers and schizophrenics. Whereas we could find no consistent difference between the electro-encephalograms of schizophrenics and of normal people, stutterers showed a distinct difference, especially in the case of the tonic type of block. So I wish to corroborate Dr. Muyskens' final statement that there is a definite correlation between neurophysiological mechanisms and the defect of stuttering.

Dr. James Lewald (Laurel, Md.).—We investigated speech defects among a large group of mental defectives in St. Louis. We found similar facts to those stated by the author, inasmuch as we found that 40 per cent of the entire population had some type of speech defect. Stammering, incidentally, was not one of the most frequent. It existed in only about 2 per cent of the language group. So, although a problem which should be handled, it is not the important problem of speech defect as found in the mentally defective child. We believe that speech should be carefully investigated among the mentally defective individuals and speech corrective methods should be used because a personality change will follow where speech can be successfully corrected. So I think, in dealing with the mentally defective child, we should find the speech defect and, if possible, give it immediate attention with an intention of correction and modification of personality traits.

Dr. John H. Muyskens (Ann Arbor, Mich.).—Dr. Haskell, I can say that I more than appreciate the interest that the administrators and those especially interested in this problem of the mentally deficient have shown in such contributions as we can make. I promise here, I would almost say with hand upraised, to do all in my power to aid you in that problem. If I prepare those graduate students who can handle this work and if you will receive them, I am quite sure that many complex problems of highly contaminated adjustment or, as we say, the social product—personality—can be entirely obliterated. I am sure that this is of the very nature of prevention, and I am deeply appreciative of your reception of these few remarks made here today.

MENTAL REACTIONS OF NORMAL CHILDREN TO PHYSICAL ILLNESS.*

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In any attempt at determining the etiological factors concerned in the development of a behavior disorder, the true significance of physical illness is of paramount importance. The statement is frequently made by parents and other interested persons, that the behavior deviation under examination, followed a certain period of illness or was first apparent after the occurrence of a particular accident. Prior difficulties are seldom admitted and outside influences are rarely recognized as being in any way responsible for the change that has occurred. The disease itself is given credit for the production of the personality change, and such disturbing symptoms as disobedience, unwholesome sleep habits, feeding difficulties, etc., are accepted as having their origin in some obscure structural change in the central nervous system or in the endocrine glands. To many physicians and more members of the laity this is a satisfactory explanation and, in addition, furnishes a convenient organic justification for the persistence of much distressing behavior. Such an attitude concentrates attention on the physical side to the exclusion of all other factors, with the result often that subsequent treatment fails dismally to produce the desired results.

For purposes of the present study, observations were carried out on a group of children selected at random from the general wards of a children's hospital. Care was taken to include in this group only those children who, to the best of our knowledge, had shown no prior behavior abnormality but who could be classed as average individuals, previously healthy and happy; children who had been able to make satisfactory adjustment to the various factors in their environment to date. These children were suffering from the

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various illnesses or accidents met with in the community at large, with the exception that cases of illness involving the central nervous system or injuries to the head were excluded. These latter cases constitute a group by themselves, where behavior is concerned, for it is well recognized by all that in them personality changes are not an uncommon sequela.

Physical illness presents three fairly distinct situations:

1. Acute illness.
2. Prolonged or chronic illness.
3. Convalescence.

The course of acute illness is ordinarily rapid. The factors, therefore, influencing the patient during this period of necessity exert that influence for a relatively short time. The childish response is prompt and varies with the changing conditions.

On first admission to hospital, when the illness is of only moderate severity, some fear is frequently noted. It is fear of the unknown on entering a new and untried environment. Everything is strange, white uniforms, suggestive equipment and the bewilderment of an ordinary admitting room routine. There has been no opportunity to become prepared for what may be ahead. If hospitals and illness have been thought of at all, they have been associated in the childish mind with things unpleasant or worse; and where, as so often happens, anxiety and emotion are shown by those he knows and who may have accompanied him from home, the child enters his new environment apprehensive of everything strange. Too often also, in an effort to allay their own misgivings, parents unconsciously suggest to the patient, by such comments as, "You are not going to be afraid" or "They are not going to hurt you," that he will be afraid and that he will be hurt. Later, when left alone, he lies waiting for that something to happen. He doesn't know what, but there must be a something.

All children do not exhibit this apprehension and fear, and where they are absent, passive interest prevails. The surroundings are strange, but these only arouse a curious interest as in anything new. No terror exists, no fretting or crying is heard.

On reaching the ward, the patient is quick to note his surroundings. He sees other individuals of much his own age and in a similar condition, lying comfortably in bed or moving about. He

is impressed by the calm and unemotional atmosphere associated with those around him and if he has been fortunate in not having had fear aroused, on his original admission, he quickly prepares to accept the situation as it is presented, not greatly concerned with what is ahead. Where, however, the child has entered the ward fearful and apprehensive, he is less receptive at first to influences about him. His confidence is obtained with difficulty and reassurances have little effect. It is only through his own experience that he learns that much of his fear was groundless. The "awful thing" he anticipated, in many cases, has not occurred and he begins to accept the understanding attention of each one on the staff with confidence and without fear. This process of adjustment does not take long, a day or two at the most and when confidence is gained, the subsequent behavior is not unlike that exhibited by the more fortunate child who was not required to face an emotional state through fear.

Where the initial illness is of greater severity, the behavior of the young patient would appear to be determined largely by the physical sensations experienced at the time. He is here not so concerned with things about him as he is with the discomfort within. Pain in its various forms constitutes the most common type of discomfort, but with this should be mentioned the distress of an elevated temperature, the hot dry skin and the persistent thirst. In response to these symptoms, the child becomes restless and fretful, tossing about in the bed, or if pain predominates, cries out in protest and alarm. Aimless requests are frequently made in his effort to gain some relief. For the time being, there is little thought for others, for the patient's horizon is restricted to his own needs and desires, whether these be fancied or real.

To the adult mind, such behavior appears often unreasonable and all out of proportion to the degree of discomfort which is probably present. To the child though, his responses are probably justified. In attempting to judge the effect of any given stimulus, either painful or otherwise, upon a child we should remember that the nervous system is not completely developed until several years after birth. Owing to this incomplete development, and its associated physiological peculiarities, a state of relative instability exists. Fewer inhibitory processes are functioning, and any change

may therefore have a greater effect than would be the case in an adult individual. The frequency with which convulsive states occur and the wide variations in temperature during illness are two common and well recognized clinical manifestations of this instability in children. So too, the response to physical pain and other discomfort is increased, and we should not consider these responses as excessive but rather accept them as characteristic of the individual of immature years.

When prostration is moderately severe but physical discomfort is absent, children show a peculiar attitude of indifference to the illness itself and its associated incapacity. The child is quite content to lie quietly in bed, seemingly mildly interested in what is going on around but showing no particular desire to take part in the activity he sees. He accepts attention when given and is usually appreciative, but he makes few demands for he would rather be left alone. His behavior here does not constitute a problem.

As recovery begins and strength returns, a change in behavior is soon manifest. All thought of pain or other discomfort is rapidly forgotten and the former happy carefree attitude begins to reassert itself. Ward activities arouse interest and a desire to take part in these activities appears, play resumes its important rôle, occupying the child's whole attention to the exclusion of all thought of illness. As far as the child is concerned, the illness which has occasioned his hospitalization is a thing of the past and he is reminded of it only when some form of treatment is continued or when dressings which may even be painful are applied. Even then his attention is held but for a short time and such treatment does not seem to interfere with his other more important interests.

It is essential in order to retain perspective to remember how often a child will pass through a most alarming and dramatic illness with no evidence whatsoever of any residual disturbance of function or of personality change. Illnesses in which even the central nervous system is obviously bearing the brunt of the disease process do not always show any sequelae. Following is an example.

CASE I.—This was the case of a boy, 12 years of age, previously healthy, who on June 5, 1935, exhibited the characteristic rash of German measles with associated enlarged and tender suboccipital glands. By the following day, the rash had disappeared.

On June 8, he complained of slight headache which persisted and on the 9th was accompanied by slight dizziness. Examination at this time demonstrated no abnormality apart from some general restlessness and slight fever. Temperature 99.6° F.

One June 10, at 3 a. m., he had a major convulsion, gross motor manifestations lasting 20 minutes followed by scattered muscular jerking. Consciousness was not regained. A second convulsion of like severity occurred at 5 a. m., a third at 6 a. m., and a fourth at 6.20 a. m.

On admission to hospital at 7 a. m., he was deeply unconscious with stertorous breathing. Pupils widely dilated and inactive to light. Optic discs normal. The eyes showed conjugate deviation to the right but no other localizing signs in any of the cranial nerves could be elicited. The deep reflexes were all exaggerated but equal. Plantar stimulation gave an extensor response on both sides.

Laboratory investigation at this time showed blood leucocyte count of 19,200, 68 per cent polymorphonuclears. Bleeding time three minutes, clotting time six minutes. Cerebrospinal fluid was under slightly increased pressure and showed a count of 50 cells, all lymphocytes. Globulin 2 plus.

Later in the day he was still unconscious, though not as deeply as on admission. He became extremely restless, throwing himself around in bed, putting his hands to his head and quietly moaning.

On June 11, consciousness returned for a short period in the afternoon, roughly 36 hours after the original convulsion, and again in the evening, but no signs of recognition on his part were apparent. He remained very restless.

On June 12, when his night nurse came on duty, he recognized her as having been with him the previous night, but no other evidence of returning memory appeared.

June 13, although at this time he was conscious and able to answer questions, his memory span was very short.

The temperature ranged during the initial phase of the illness from 101.4° to 102.8°, returning to normal on June 14. The extensor plantar response disappeared on June 16, but the deep reflexes remained overactive for several months.

The diagnosis in this case was encephalitis following German measles.

The memory defect persisted in this boy's case for several weeks and introduced a difficult problem in the management of his convalescence. Formerly a very cooperative child, he would entirely forget the instructions of his physician from one day to the next and rebelled excessively against the necessary restrictions imposed by his illness. On first returning home, he had little recollection of having been in hospital but memory gradually returned and by July 10, he had apparently entirely recovered.

His subsequent history has been uneventful. He returned to school on September 1, and reports from that source have remained consistently good. He has been seen at regular intervals since his illness and there would appear to be no change whatsoever in his behavior from that characteristic prior to June, 1935.

Prolonged Illness.—In prolonged or chronic illness the essential situation differs somewhat from that met with in the acute form. In the latter, the course of the illness is rapid and recovery usually prompt. The disagreeable things associated with the disease having acted for a short time only, leave no deep impression and are soon forgotten. In the former, however, although the onset may have been just as severe and attended by equally disturbing constitutional symptoms, these symptoms usually abate in degree only and in a lessened form continue. They continue over a longer period and it is this increase in the time element which permits influences of lesser magnitude to produce results of a different character.

Certain chronic physical illnesses are associated with more or less characteristic behavior reactions which continue throughout the course of that illness. It is probable that these reactions are occasioned by the persistence of types of discomfort peculiar to the disease.

The child suffering from cardiac disease, whether it be myocardial in type or otherwise, often demonstrates an attitude of apathy and listlessness out of proportion to the physical signs which are present. This has been variously interpreted as being due to the discomfort and restriction of an impaired circulation on the one hand, or associated with the continued constitutional disturbance of an attendant toxemia. The patient is moderately interested in things about him but his attempts at play are half-heartedly carried out. Toys are picked up, then laid down. The child occupies his time watching the activities of the ward rather than making any effort himself to take part.

In contrast with this behavior is that of the child who is afflicted with one of the irritating skin conditions, which so frequently persist. Here excessive restlessness predominates. Interest is more readily aroused but the distracting influence of the itching and burning disturbs attention. The patient remains fretful and irritable, impatient with his surroundings and making frequent complaints. These reactions continue until some relief is obtained, but when relief does appear they usually cease.

In that larger group of cases, where actual physical discomfort is not a predominant symptom, an attitude of comparative indiffer-

ence to the illness itself is seen. Enforced inactivity is accepted without much comment other than a possible enquiry as to the reason why such restriction is necessary. But even this mild concern is frequently absent. The patient shows a ready adaptability to the changed conditions of being ill and proceeds at the earliest opportunity to make the most of everything the occasion presents. His inherent powers of imagination come to his aid and if furnished with simple articles of play will invent little games with which he may occupy himself for an hour or more at a time.

Individual tendencies, of course, appear on the surface and make for a variation in response, but wide variations seem to disappear as if tempered by some common understanding among the children themselves. Such understanding may be due to the experience of illness and to the knowledge that others have suffered in a like manner to himself. At the same time, the influence of example is important. Whatever may be the reason, one feels that there is at this time an undercurrent of consideration for others. The little fellow has his champion, disputes are easily settled, and a happier state results. The child in bed does not appear to be particularly envious of his more fortunate companions who are able to be up and about the ward. He feels that they are lucky but he does not fret. He accepts the added opportunities that these others supply and looks forward to the time when his own recovery will have advanced to the point where he too can get up.

In a children's hospital ward the patient is surrounded by an atmosphere of neutrality. It is a calm, matter of fact and unemotional environment, to which the patient responds. No undue stress is permitted to be attached to minor complaints and demands, and the child is unconsciously led to assume his proper place in his little community.

When ill at home, conditions are different. The same calm and unemotional attitude may be maintained in the wise household, but too frequently the converse is true. Here the patient is surrounded by anxious parents and friends who are always attentive to his every complaint. They are as much concerned with the possibilities of the illness as they are with the illness itself. A situation may develop in which the illness assumes an importance quite out of line with the facts that exist. No one will criticize expressions of

sympathy or reassurance voiced by friends, in the face of evident pain or obvious distress. When, however, such expressions of sympathy are not tempered by good judgment, there is a disturbance in perspective and the element of emotionalism is introduced, to the marked disadvantage of all concerned.

CASE II.—This was the case of a boy, nine years of age, who had passed through a prolonged and serious illness and who on return to school began to show variations in behavior.

The variations in his behavior were interpreted by his teacher as true personality changes due to his illness. At home, he was reported as being very nervous and restless, continually twitching and biting his finger nails and wanting to be on the move.

On February 27, 1934, 18 months prior to our first contact with the case, this boy had been admitted to hospital in a state of uræmia. Two weeks prior to admission, he had suffered from an attack of acute tonsillitis with some cervical adenitis. This was followed a week later by severe headache and vomiting and with the appearance of blood in the urine. On the day of admission, a severe major convulsion had occurred.

On admission, he was very drowsy, irrational and very irritable. The tonsils were still inflamed. The heart, lungs and gastrointestinal systems were normal. The deep reflexes were all brisk but otherwise the central nervous system was negative.

Temperature 103.6° F. Pulse 96. Blood pressure 160/120.

Urinalysis: albumin, 4 plus; blood, 3 plus; acetone, a trace; nonprotein nitrogen, 67 mgms.; creatinine, 1.82 mgms.

February 28: Several generalized convulsions occurred. Temperature remained above 103°. Blood pressure dropped to 145/105. Urinalysis continued to show albumin 4 plus and blood.

March 1: Very irritable and irrational. Rigidity of the neck appeared with Kernig's sign present.

Lumbar puncture showed fluid under normal pressure. Cell count 475 85 per cent lymphocytes.

Urinalysis: albumin 2 plus, no blood; non-protein nitrogen 38 mgms.; creatinine 1.30 mgms.

March 3. Blood pressure still raised but patient rational.

March 9. Cerebrospinal fluid cell count 66; 80 per cent lymphocytes.

March 15. Temperature normal. Pulse 100. Blood pressure 146/92. Urinalysis: albumin 1 plus; blood nil; nonprotein nitrogen 30 mgms.; creatinine 1.58 mgms.

Cerebrospinal fluid cell count 1.

May 5. Discharged from hospital.

Diagnosis—acute nephritis with uræmia; serous meningitis.

On September 1 the boy returned to school and was placed in the same grade as prior to his illness. The teacher quickly noted a change; where

formerly he had been a happy alert child, interested in his work and his play, he had become inattentive and disinterested. As the term progressed, he became increasingly restless and emotional. He seemed unable to concentrate and at each successive monthly examination his standing was lower.

When examined on May 13, 1935, he appeared as a moderately alert, attractive looking youngster obviously restless and fidgetty, but cooperative. Physical examination was essentially negative. Nothing abnormal could be demonstrated in the central nervous system. Kidney investigation was reported as demonstrating normal functions.

Psychometric examination gave chronological age, 9^8; mental age, 10. I. Q. 103. Throughout this examination the boy made little effort to exert himself and was inclined to make excuses of fatigue at the beginning of the test; later however, although his work was rather hurried and careless, he did settle down to more serious effort.

Social investigation brought to light some interesting facts. This boy was the youngest in a family of four children and was eight years junior to the next older member. He had always occupied the center of attention at home and had been permitted to live a more or less adult life in the home. He had had a great deal of success as a juvenile speed skater, having won ten medals and a silver cup. The contests had been held at various urban centers and had brought increasing attention and some newspaper publicity. Following his illness of 1934, all physical activity had been markedly restricted and during the winter all sport, including skating, entirely eliminated. In addition, the boy's mother who appeared as a good-natured, hard-working capable woman, had been unable to throw off the dread and apprehension aroused during his original illness and openly commented that the "convulsions" and "comatose state" "still haunted" her. She recognized that probably as a result she had "babied" and given in to him more, but attempts at discipline at home had aroused in the boy such "nervousness and trembling" that he was permitted to have his own way "lest he have a convulsion."

Coupled with this atmosphere of emotion and indulgence at home was the fact that on his return to school he had been asked to repeat the Senior II grade, a grade in which the work was not sufficiently interesting or challenging to a boy of his mental age.

In this case, the behavior deviation was not due to the original rather serious illness but to the atmosphere of restriction and emotion which had been permitted to develop in the home after the boy had returned practically to his physical normal.

On the assurance that the boy was physically well and quite capable of participating in any activity which he might desire, the parents were persuaded to consider and treat him as an average youngster. His illness was a thing of the past. A more wholesome routine was instituted for him with regular hours and less outside help and arangements were made for his active participation in organized sports. His school work was adjusted and with the modification in his environment this boy has become his former happy, active interested self.

The degree of severity of the initiating illness or accident bears no relation whatsoever to the behavior change for which it is blamed. Most trivial accidents and minor illnesses are frequently accepted as being responsible for symptoms that appear.

CASE III.—This was the case of a boy nine years of age who, three years before, was reported to have been knocked down by a wagon. In this accident he sustained some superficial bruising of one hip. No fractures occurred nor was there any injury to the head or disturbance of consciousness. It was stated, however, that ever since the accident the boy had been nervous and restless, exhibiting a persistent muscular twitching and complaining of headache and various pains in the body.

The symptoms had increased markedly during the past year and the complaint of pain and muscular jerking had become so severe that he had been removed from school and put to bed, a diagnosis of chorea being made. Rest did not modify the symptoms and admission to hospital was advised.

In hospital, very complete examination failed to demonstrate any physical abnormality, or any organic basis for his varied complaints. His symptoms though, gradually disappeared and he was discharged from hospital cured.

On his return home, his former signs of nervousness returned. At school he was considered one of the worst behaved children which which they had had to contend. He was restless and irritable, disobedient and disturbed the other children in the class.

In the clinic, physical examination was again entirely negative. He was an overactive, ill-disciplined youngster, somewhat babyish and impertinent, very dependent, and gave the impression of a throughly disorganized, poorly adjusted individual.

Psychometric examination gave an intelligence quotient of 97, and in this test he was over-active and excitable, easily distracted and his effort was poor.

In the home, no uniformity of plan of management existed. The father was a quiet industrious man, a member of the municipal police force, who was very concerned about his son's behavior. He knew of other policemen's sons who were little credit to their fathers or the community. He knew of the atttitude of these other boys who, knowing that their fathers were policemen, felt that they could do anything they wished without fear of consequences. The father further felt that his wife was too lenient with the boy and for this reason, believed it necessary on his part to be rigidly severe.

The mother had always been physically well but never had had any confidence in herself. She had never been able to take a firm stand with the boy. She nagged at him continually but never made certain that he did what he was told. She, on her part, felt that her husband was too severe and she justified her management on this point. Quarrels resulted and the home atmosphere became tense. The mother believed the boy's behavior to be due to the accident he had sustained when six years of age, but a brief investigation of the home had readily shown where the real cause lay and foster home was advised.

The third situation with which we are concerned is convalescence, that period during which there is gradual recovery of health and strength following disease or injury. While the illness is still active, all attention is focussed on the physical needs, and other requirements are for the time being forgotten. Discipline has been relaxed and every want gratified. The patient has not been held responsible for his own irritability, his tempers or his unreasonableness, for excuses have been always found. During this time, the child has been led to assume a position within his surroundings which he does not remember as ever having experienced before. It is not an unpleasant situation to him, this lack of restraint, and where there is no reckoning to follow. He may have learned also that certain complaints on his part produce a definite response and if this is pleasurable he will unconsciously resort to these symptoms to gain a desired end.

There is no more difficult problem with which parents and physicians are confronted in this phase than that of determining the proper course to guide the patient back to his former attitudes and behavior as speedily as possible, and still conform to the restrictions of his physical state. Certain habits have been learned and some pleasures experienced, pleasures and habits which the child may not wish to relinquish without opposition and protest. At the same time, the demands of convalescence often require the cooperation of the child along lines which to him are irksome and it is not surprising that he may rebel. It is too much to expect the child to exhibit that degree of judgment and insight which only experience can give or to conform to restrictions which he does not understand. Physical discomfort is one thing he does understand and respect, but if this is absent he knows nothing of the needs of a weakened myocardium or of a lowered hæmoglobin, and he is largely governed by his desire to be doing something or to take part in something that others are doing.

Interest and desire for physical and mental activity which rapidly return after an illness, lead the child to his natural outlet for pent-up energy, namely play. In play, he is able to devise problems within his understanding and attempt to solve them. In play, he has a means of escape from reality which is entirely different from that other means of escape, day-dreaming; for play is constructive

and it affords also the opportunity to supply the various needs of the child during his period of returning health. Play, however, must be active, not passive. If the patient's waking hours are occcupied by entertainment supplied by others, it becomes mere amusement devoid of any effort on the child's part, and a lazy habit of mind results. Too often the child is not left alone to his own devices or permitted to exercise his own creative powers but is read to, played with and deprived of that degree of initiative so essential to complete adaptation and with which most children are endowed.

In the early stages of convalescence, it is often difficult to arouse interest and when aroused, to hold attention; where organized play has been employed as an integral part of the management of convalescence, this characteristic has been recognized. Group play is employed and shorter periods of varying activity have been more beneficial than any one game continued for a longer period. Play activity is the best method of preventing the beginning of those neurotic tendencies so prone to follow a prolonged illness or convalescence, for it lessens fear and creates a sense of confidence and security in something the child can understand. The child absorbed in play has less time to feel sorry for himself, less reason to build up grudges towards those about him and is less likely to become habituated to the state of invalidism. With the introduction of play the child is treated more as a personality and less as a patient.

In considering the effect of physical illness or injury on children, there is no more instructive group than those suffering from massive body burns. Here the child experiences all the phases of acute illness, the initial shock with constitutional symptoms, the excruciating pain which may last for days; and this is followed by a long period of convalescence during which the patient is forced to assume often awkward and tedious postures in the effort to maintain a minimum amount of discomfort. Yet through it all one sees these children retain their humor and appear happy, interested and keen to take part in any activity permitted by their mechanical restrictions.

Physical illness in the life of an average child is an experience to be accepted and to which adaptation is made, but when passed is

forgotten. When we exclude those cases in which organic damage has been sustained by the central nervous system, we are left with the conclusion that physical illness *per se* is not a causative factor in the development of behavior disorder. If such deviations do appear, they are the result of environmental influences which have acted during the period of incapacity.

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THE IMPORTANCE OF NEW DEVELOPMENTS IN MACHINE OPERATIONS.*

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Generalizations as to the feebleminded are dangerous. By and all here is no more than a large number of persons who present a similarity in their lack of what we are pleased to call " intelligence." Concerning intelligence we are really sure of only two things. (1) That we do not know what it is—that we have no satisfactory definition for it. (2) That, whatever it is, it plays a relatively small rôle in the total problem life adjustment. Loyalty, sympathy, hatred, faith, fear, the sex drive—perhaps any one of these random examples from the emotional life bulks larger in one's total life adjustment than does " intelligence."

If then we enumerate three " characteristics of the higher types of the feebleminded " it is with the realization that there are many exceptions, that they cover but a small sector of the total equipment of any such individual and that there are many in the borderline, dull-normal and even higher groups of whom the same things might be said. These characteristics are:

1. The high grade feebleminded are well equipped to perform repetitive tasks. Even where the operations are of a complicated nature, the feebleminded carry them through with efficiency if they are processes in which the element of repetition is predominant. There is no real statistical evidence as to the pre-eminence of the group but there is considerable folk-lore and some clinical data in support of the contention that in repetitive production tasks the feebleminded group excel those of higher intelligence. This is obviously based upon the belief that the higher groups need more imaginative and challenging tasks and that they chafe under mere repetition.

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2. The feebleminded lack judgment in meeting emergencies in machine and industrial operations. In personal adjustments, in personal danger, in such matters—for instance—as driving an automobile, they may be freer to act promptly in the proper way than are more highly organized individuals. However in the handling of "cold" data—whether it be the curriculum of the school room or the breakdown of a complicated piece of machinery—this group is defective. Indeed such inadequate definitions of intelligence as we have act to place precisely this group into the category of the feebleminded.

3. The feebleminded lack supervisory ability. This statement has less assurance than the previous two. Wherever supervision involves chiefly personal relationships there is no data to indicate that the feebleminded are any less able to "get the work out of the men" than are the higher groups. However they are at a disadvantage in situations where there is the constant appearance of new and unpredicted problems requiring rapid adjustment.

In shorthand terms we may then at least say of this group that it (1) makes satisfactory adjustments in repetitive operations, (2) does not do well in impersonal emergency situations and (3) is more efficient in direct production than in supervision.

A similar approach to certain characteristics of the industrial era in which we live demands first a realization that there is no such thing as Industry—but rather a myriad of industries. Again we have no intention of cataloging *all* of the possible characteristics of this period. For instance this paper does not consider the question as to whether the machine has replaced human labor. This particular horse has been trotted around the track so many times that you would be bored to see it again. It does seem fair however to make two generalizations—statements that for the most part hold good in the general field of machine production. These are:

1. Machine operation has been largely automatic. It has required a relatively specialized and repetitive type of activity on the part of the operative. The machine has done a job more accurately, more uniformly and more rapidly than a human—but it did only one job and it waited upon its operative before it could go to its next unit of work. Thus the machine of the industrial era has demanded what we term the "production worker" in that it was ultimately dependent upon one or more workers for the speed of its operation.

Cigars were made by machines but these could not work any faster than the slowest of the four workers who fed or operated the mechanism at various intervals in the making of the product.

2. "Production workers" in the sense used in the previous paragraph may be recruited in large part from the ranks of the intellectually retarded. Their work is highly repetitive. They are faced with the sort of task which not only fails to challenge interest and imagination but which actually makes these wanderings into phantastic realms dangerous procedures—as leading to personal accidents. The widely noted observation that factory production has demanded practically no training and that the working man has thus been robbed of the bargaining power of a specially learned trade speaks eloquently of the premium which the industrial age has placed upon intellectual retardation.

Nothing said so far is new to any of you. Indeed it is precisely because you have recognized these facts and have built your programs accordingly that I am presenting this paper. You will recall the early interest in the feebleminded, the comforting assurance that all problems of crime and social inefficiency were due principally to this group. You will recall then our recognition of heredity as the most important of the causative factors and our brave embarkation on an institutional program which would take the group entirely out of the general social stream. Finally we came to recognize that a very fair portion of the world's work is done happily and efficiently by the higher grades of the feebleminded. We now think of our institutions much more in terms of training than of custody. We have long since found that the "production worker" is the life blood of industry and that with proper training the high grade mental defective makes the very best of production workers.

The programs which we have for the future are based on these same premises. We are not looking to a vast institutionalization but to training programs of better worth. The Depression has increased the difficulty of employment but we have been sure that as the wheels of industry again merrily spin, the feebleminded will no longer be on the rolls of relief organizations.

However industry, too, has been changing. The machine tool makers' exhibition in Cleveland last September (which happens to

be the source of this paper) may well give us pause. Developments run back 20 years or more but they have matured very rapidly in the last five years.

May I make a statement that is overly simple as a means of throwing this whole matter into relief? This is, simply put, that modern machines instead of requiring production workers do their own producing and now require maintenance workers. The individual who produces cigars with the aid of machinery is a very different person from the highly trained mechanic who must meet the manifold emergencies of a machine which does its own producing. May I take an example from another field because it is familiar to us? The telephone operator is a typical "production worker." Her manipulations are relatively simple, her speed controls the speed with which calls can be put through, her task is relatively repetitive though of course nowhere near so much so as in the case of the factory worker. The dial system makes its own calls, uses maintenance workers instead of production workers, demands the highest kind of mechanical skill and intelligence. Or if you go into a huge steel rolling mill which is producing at capacity, of course the first thing you note is that the place seems literally deserted. We are not interested in this fact in this paper. The important matter is that those workers who *are* there are highly intelligent and highly trained maintenance workers—meeting manifold and entirely unpredictable emergencies in the operation of machinery.

I have thus been all the way around Robin Hood's barn to arrive at one very simple and, I believe, extremely important statement. This is that industry gladly absorbed the feebleminded as production workers but that industry cannot absorb this group as maintenance workers.

This point seems so clear and its implications in our whole present program of the institutional and parole structures for the feebleminded seem so devastating that I am not called upon for further elaboration. The only question left is as to how rapidly this change is occurring.

The beginnings of changes such as this are hard to determine. During the twenties all of the large industries except the so-called family industries were definitely planning towards substituting maintenance for production workers. The two great family

industries (paper and textile) had made practically no steps in this direction but it was freely predicted that they would follow as soon as general stockholders began replacing the family interests. In the other industries as late as 1930 (before there was clear recognition of the length and depth of the Depression) it was said that "if we had not been so busy keeping up with production demands we would have been making these changes." The engineering personnel had already projected the possibilities.

Last September an exposition was held in Cleveland—involving the developments in machine tools over the period since 1929 when this group had had its last convention. This is no place for mechanical details. The following facts are attested in the leading engineering magazines and by engineers, plant superintendents, etc., who attended the exhibit.

1. It is by some 30 per cent the largest exhibit this group has held.

2. The new machines show a startling advance over the previous ones.

3. The changes have featured increased accuracy in the product and the combination of two or more processes in one machine.

4. The changes have featured that what is termed speed, feed and traverse are all brought under the control of one central operating position.

5. The machines are so complicated and so multiform in their jobs to be done that "with many, failure of the worker to focus attention for as long as 2 seconds will result in expensive tool failure or worse."

From this exposition I only wish to stress the following:

1. The Depression has meant that relatively few new machines have been installed in industry over the last six years.

2. This slump in production has allowed the engineering staffs to make rapid strides in the perfecting of machines requiring maintenance rather than production workers.

3. The "return of business confidence" which we all await undoubtedly means a renovation in which there will be a sudden and quite widespread replacement involving the installation in large degree of machines requiring maintenance workers.

This trend in industry is of the greatest importance to such of us as in "progressive" fashion make plans for further paroling of the feebleminded who are by no means equipped to be maintenance workers.

This paper has nothing to do with the goodness or badness of a situation. Nor does it call you to issue fiat against this change in industry. It suspects anyway that change does not bother the human race—but only the speed with which change comes. It wishes to point out:

1. That we have been and still are in a period rather unusually propitious for the social adjustment of the feeble-minded who make, by and large, excellent production workers.

2. That our rather extensive programs of training and extra-mural placement of the feebleminded have been based upon the belief that there is (at least in "good times") rather an unlimited market for the production worker.

3. That industry is increasingly replacing production by maintenance workers and that the period of the Depression has been one of unprecedented progress in this line.

We have no need of nor success in crusading against such changes. In the end it will be our programs that will have to be modified.

DISCUSSION.

DR. STUART QUEEN (St. Louis, Mo.).—Dr. Plant has set forth so clearly and so convincingly the transition from a demand primarily for production workers to one that is increasingly for maintenance workers that I see no need of further comment upon that particular point.

Neither do I have at hand any ready solution for the problems presented. Instead I shall devote my discussion to pointing out some additional complications to a situation already made difficult by these changes pointed out by Dr. Plant.

First of all, technological improvements complicate, not only for the mentally deficient, but for all workers the problems of their replacement in industry so long as they are unaccompanied by redistribution of buying power.

In the second place, the organization of a considerable part of the skilled workers in American industry has hampered and apparently will continue to hamper the effective placement of those less skilled, including a good many of the feeble-minded. Then there is the matter of industrial insurance, whether against accidents or against unemployment or other hazards of modern life in which some of the less skilled and less competent are frequently if not uni-

formly regarded as bad risks, thus imposing a further handicap upon the placement or replacement of these people in industry.

It would seem from these and other matters which might be considered that there is pretty obvious need of some considerable economic reorganization; of what particular character it may prove to be ultimately is not our momentary concern, though it is an enormously important matter for all of us in the immediate future.

The presence of any considerable number of mentally defective folk may hamper the bringing about of such reorganization; at least there are questions to be solved which involve them in relation to other workers whom we assume to be normal. In the first place, they are not particularly acceptable to the trade unions which may potentially play a significant part in economic reorganization; whether they actually will remains to be demonstrated. In the second place, that sort of development which we recognize under the general name cooperation, whether producers' cooperation or consumers' cooperation, might make use of handicapped folk, but because the "coops" are struggling for their very existence, they will not have much time nor energy to devote to those who are not able to put well-rounded and well-developed bodies and minds into the tasks.

I suppose it is not inconceivable that those of limited intelligence may be especially manipulated by defenders of the *status quo ante* in their effort to maintain or restore that which they regard as desirable, and it is not impossible that likewise if and when drawn into reform or revolutionary movements, they may be led inadvertently or otherwise to deeds which may discredit those movements.

These are some of the further complications of the problem which Dr. Plant has so effectively opened up. In the meantime, I suppose there are some possibly hopeful aspects of the situation for those who have immediately before them the task of finding places to which persons who have graduated, shall we say, from training schools for the mentally defective may go. It is no doubt true that as prosperity or something like that returns for the middle and upper classes, there will be an increased demand for domestic service of various kinds.

I would not be surprised if, in line with some of the developments of the New Deal, the type of projects developed under WPA might not be rather more adapted to the mentally deficient than to the mentally more competent and perhaps some of the self-maintaining colonies might be turned primarily into ventures for persons mentally handicapped. I have no reason to believe that either of those things will be done, but they occur to me as not beyond the realm of possibilities. If and when industry itself absorbs those whom it can absorb, there will be a considerable left-over group of less competent folk, some continuation of the WPA type of projects and self-maintaining colonies might quite conceivably afford an outlet for those who have gone through the training schools and thereby at least tide over for a time until in the course of further industrial reorganization some new sort of function for the mentally defective may be found and they may be worked into such positions.

DR. PAUL L. SCHROEDER (Chicago, Ill.).—I have been tremendously impressed with the presentation that Dr. Plant has made, and I am sure you have, too. If any of you doubt the difference between the production and the maintenance worker, I suggest you stop for a moment and watch the man handle the levers on a steam shovel preparing the foundation for a large new building. I am sure you will agree that in understanding work of that sort a high degree of intelligence is required. I might add also it is so intriguing that it is hard to resist asking for an opportunity to get one's hands at the levers himself.

Dr. Plant has given us a real awareness of the problem that is here with us now, has been for some time and surely is going to be increasingly so in the future. He offers no immediate solution for it but suggests a way to proceed and suggests also some of the difficulties that are in the way.

As Dr. Queen has done, I should like also to add some of the problems that I see in the way. There is the additional problem of delinquency which is not at all uncommon among our mental defectives. If we go beyond the level of the high-grade defective into another group of defectives whom we are pleased to call borderline defectives, we more than double or treble the number with whom we must expect to deal in this problem. We are faced also with the difficulties and the conflict which is presented in the larger philosophy of child health and protection. There is a definite movement on foot to increase the age at which children may leave school and enter employment to eighteen and in some communities twenty-one years. We had some concern over this problem a few years ago in connection with new proposals for child welfare legislation. We suggested at that time that those children who were obviously unable to advance and benefit further from the usual school instruction might be permitted at fourteen years of age to enter some form of employment or apprenticeship, rather than attempt to benefit by further academic school instruction. It was to be protected by the provision that persons informed, able to select these children, would serve as a basis for withdrawing them from school. This was violently objected to, especially on the part of people most concerned with health and protection of children, particularly those who were proponents, and rather strongly so, for child labor regulations. Their position was accepted as preferred. After it was proposed that the real problem here be met by the schools, that these children instead of continuing in the usual school program might be provided with practical instruction in industry, going beyond what is commonly devised and utilized now as vocational instruction, they were actually to enter vocations under supervision of the school.

There are other problems which will develop as time goes on. I am sure one of those is that we must know better than we do now what a mentally defective child can do with his hands. Some efforts have already been made and some very useful material has already been presented.

It seems to me, therefore, that the challenge before us is one that has wide ramifications, that it clearly is a joint problem of the institutions dealing with mental defectives, with the juvenile courts concerned with the problem of dependency as well as delinquency, with the penal institutions

concerned with the problem of crime; and that it surely also involves industry. I am so thoroughly in agreement with the paper presented by Dr. Plant that I feel that the challenge is such that we should prepare from this point on to make further efforts to meet it.

DR. JAMES S. PLANT (Newark, N. J.).—I have nothing to say except just a word of defense after finding myself jockeyed into the position of raising a problem without having any answers for it. I suspect that we in America can solve the problems of which we are aware. I feel that our lack, so far as concerns this change in the industrial situation, is one of not wanting to face the problem rather than one of what we can do about it when we do once face it.

There are two things which trouble me. One is that those of us who are preoccupied with psychoses and the mentally defective situations are rather prone to forget the social implications of the lives of these individuals. The other, that very largely the field of psychiatry and the field of social work are looking forward to the end of the depression as something which will bring us back again to the problems which we had in the twenties. I have wanted rather definitely to indicate to you that we are to-day no more ready for the end of the depression and what it brings than we were in 1930 for the depression itself. That may seem to you rather pessimistic, but I see no pessimism in facing the facts.

PSYCHOGENIC FACTORS IN OVERT HOMOSEXUALITY.

By GEORGE W. HENRY, M. D.,
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This paper is a preliminary report of a study * of 100 socially well adjusted men and women whose preferred form of libidinous gratification is homosexual and who regularly experience pleasure from homosexual relations. This study includes a detailed psychiatric investigation of the family and social background and of the personal history. In addition these individuals are being studied from a general physical, morphological and endocrine viewpoint and stereoscopic X-ray records of the head, chest and pelvis are being made.

Unfortunately the series is not yet completed and it is not possible to make comparative notations. Psychiatric investigations have already been made in more than 80 cases and the information obtained seems to justify a report of this aspect of the study.

Much of the factual data regarding the forms of homosexual expression has long been available through the excellent descriptions of many well-known students of this subject. The subsequent theoretical generalizations of the Freudians have greatly widened the interest in homosexuality and have called attention to its intimate relation to personality disorder. Statements have been made regarding the influence of heredity, constitutional factors have been assumed and the psychogenic aspects have been stressed, but little progress has been made toward eliciting evidence of all these various factors in individual cases. It is hoped that this study will add to our knowledge of the causes of homosexuality, give indications for its treatment and call attention to adjustable factors in its prevention.

The persons who have submitted themselves for examination came voluntarily after being acquainted by a field worker with the nature of the study. They have offered themselves because of their

* This study is one of the projects sponsored by the Committee for the Study of Sex Variants.

interest in a scientific investigation of a human relationship which they believe is unjustly frowned upon by society. Most of them belong to the professional class and all have sufficient educational and social background to make a detailed psychiatric investigation profitable.

I am presenting four illustrative cases, not because they are especially unusual, but to call attention to the natural sequence of events in each case, and to the fact that each case is an individual problem, sufficiently different from others to permit of few generalizations. The names employed are of course fictitious and other precautions have been taken to conceal the identity of the persons involved.

CASE I. *Lack of Masculine Ideal. Identification with Mother.*—Frank Thompsen is a witty, humorous, 28-year-old son of a prominent family, received in the best homes as a popular guest and companion in spite of the fact that he has an international reputation as a homosexual. At any time after dinner he is likely to become a social liability because of excessive drinking. He has no occupation.

His family is conspicuous for its lack of effective, masculine males who might have afforded him an ideal. His father was an extremely gentle, dreamy, idealistic, effeminate person, an only son who continued to be entirely under the domination of the paternal grandmother even after his marriage. Both Frank and his father were left orphans in early childhood through the death of their respective fathers. On the maternal side the males were equally uninspiring. There were no uncles and the grandfather deserted his family. His reputation was such that he was held responsible for any delinquencies in the family. A step-father acquired when Frank was five was helpless in dealing with the mother, who is described as being the most selfish person in the world. She has a terrific temper, and she commands by threatening or by bursting into tears.

Until Frank's father died the mother had continued under the domination of her mother and her mother-in-law. The latter not only lived with Frank's parents but was in complete control of the household. The maternal grandmother is an unyielding, capable executive who feels responsible for the entire family even to the extent of arranging for their burial. Until the mother became a widow she submitted to her own mother's domination. Then the mother rebelled and started upon a career of reckless dissipation.

As a child Frank was terrified by the attitude and manner of his maternal grandmother and he was much attached to his mother. "The family thought I was her pet." With the mother's rebellion and dissipation he gradually became disillusioned but he still feels she has tremendous charm. "I was very, very fond of her but after I was six or seven I was scared of her—frightened by her temper. She would scream herself into hysterics. We

never knew when Vesuvius was going to erupt. Then I became frightfully critical. I didn't like the way she drank. I associated drinking with tantrums."

Conditions in the home proceeded from bad to worse. By the time Frank had reached puberty his step-father had developed paresis and was confined in a mental hospital. His mother was then living with another man with whom the relationship was that of drunken brawls. "Mother would get drunk with the cook if she couldn't find anyone else. Then there would be no dinner that night. I was always terrified to bring friends home. She might be the most charming mother or she might be stinking and throw things at you. I never could tell what she was going to do."

At 16 Frank felt he had no moral obligation to remain in the home and left. He had shown a marked preference for his own sex since early childhood, including overt sexual relations. "As far back as I can remember I have been drawn to men." As soon as he left home he indulged himself without restraint. He began to drink to excess—"I took to it like a duck to water"—and he was thereafter easily seduced by either sex. In his first heterosexual experience at 17 a woman came to his room and practically forced herself upon him. He managed to avoid her thereafter. Two years later he was pursued by another young woman to the extent of becoming engaged and although she was sexually promiscuous they never had sexual relations. She left him to marry another man.

Otherwise his sexual interests and activities have been concentrated on men. He prefers the big strong man exemplified by the chauffeur to whom he was attracted at the age of five. "I haunted the garage to see him in his undershirt. I remember the blond hair on his chest. It fascinated me."

His most profound attachment was at 23 to an older man married to a virgin Lesbian. "That was the big thing in my life. It was just an emotional tempest from which I will never recover—one of those violent, incredible, intense things." This man and his wife were in turn completely dominated by another Lesbian who after a few months made it impossible for Frank to continue his relations with this man. Frank then attempted suicide by cutting his wrists and drinking bichloride of mercury. "Since then I have had constant, promiscuous homosexual encounters. None of them have meant very much. I accept sex in a very detached way."

Within the past year he has reestablished a platonic alliance with two women. One of them is his sister, five years older, whom he thoroughly disliked as a child. Her tragic marriage and his own mishaps have drawn them together. She was highly sexed and her husband was impotent. His chief interest was in pictures of beheaded women. After the husband had committed suicide in a particularly gruesome manner, she and Frank became "terribly devoted to each other—I have a tremendous respect and real love for her."

The other alliance is with a "very charming, lovely virgin," old enough to be his mother. At her suggestion he is living in her apartment. "There is no thought of physical relationship. We are just extremely good friends. We merely kiss in a casual way. She regards me as her son." She is unusually tolerant and makes no objection to his homosexual activities.

CASE II. *Identification of Brother and Sister.*—Harry Klein is a 24-year-old student who retains the juvenile characteristics of a manly boy. He is rather timid and uncertain in sexual matters but likes to give the impression of being a seducer. In a mixed group he hides his interest in men by a simulated attentiveness to women. His indecision pervades his scholastic as well as his erotic activities. He cannot decide what professional career to follow and he starts one course after another without completing any.

His father's people were of peasant stock, extremely selfish and penurious and not interested in education. "We had very little in common." Nothing is known about the maternal side except for the mother who was very hard working, generous, not intelligent, easily influenced by others and submissive to her husband.

Harry is the only boy and he has one younger and four older sisters. He knows that his father was extremely anxious to have a son in order to carry out the Jewish custom of saying prayers after the father's death. In spite of lack of interest in religion Harry still maintains an attitude of humoring his father by attending religious services. Although Harry slept with his mother until he was seven she does not seem to have made much impression upon him. She died when he was 12 years old.

Three of his sisters are more than 10 years older, all married and apparently they never paid much attention to him. The other sister, Bessie, six years his senior, has always been a dominant influence in his life. She is decidedly aggressive, always quarreled with her parents and in spite of them managed to stay in school until she had received a university education. She led in a rebellion which separated herself, Harry and his younger sister from other members of the family.

As a child he was frightened by the darkness and had to have a light burning in order to get to sleep. He wet the bed and was troubled by vivid dreams of train wrecks, hold-ups and of falling off cliffs. "My sisters used to tell me about the boogie man in the cellar to keep me from following them around. My mother never punished me. I had full control as far as she was concerned. I wouldn't eat what she had cooked but she would give me money to buy doughnuts. I was completely spoiled and wholly out of her control. My sister, Bessie, controlled me. I was controlled by being given things. I was very much attached to my sister. I looked up to her and considered her an entire woman. I was not so much attached to my mother."

His homosexual interests were aroused in childhood and he tells of an experience with a negro at the age of seven. Men paid him small sums of money to satisfy their desires. "When I was about 12 I used to get fainting spells when I was overheated. They suspected I was masturbating. Bessie asked me but I told her I had no sex feelings."

"I used to dress up in girls' costumes to amuse the guests. I teased girls. They would never come near my house because I would beat and scratch them. I was afraid to fight with boys. They used to call me sissy and I used to want to be grown up so they wouldn't."

Throughout adolescence he was pursued by others and as a result had numerous promiscuous, homosexual relations. Occasionally while intoxicated

and in the presence of other men he would attempt heterosexual relations but he was often ineffective.

At 17 Bessie began to play a dominant rôle in his erotic life. She took him with her on sophisticated necking parties. At this time he established a homosexual liaison with Jacob, a decidedly effeminate boy. Within a year Jacob was trying to interest Bessie. Harry was then exposed to one of Bessie's girl friends. Thus paired they would get intoxicated and indulge in amorous embraces. Harry was not pleased with this arrangement but he did develop some feeling for his girl. "I now think a sublimation for Jacob was coming out in this girl." His desire for Jacob increased and on being repulsed he went to sea in the hope of becoming more manly.

Four months later he returned home to find that Jacob had developed a great passion for Bessie. "She is similar to me and it is natural that this should happen." In other words Harry believes that Jacob found in Bessie a substitute for himself. "I was pestering him and he was begging Bessie. I objected to their intimacy and Bessie said she didn't like Jacob because he was too effeminate."

Finally Bessie acknowledged that she had slept with Jacob but added that she didn't like the experience. "I had been liberal but I couldn't accept Jacob's attention to my sister. I lost 10 pounds in one week." Harry attempted to resume his interest in Bessie's girl friend but he was impotent. His relationship to Bessie became strained to the point of having violent fights with her. "I decided I wanted to live alone and that I didn't want to be dominated by Bessie. This was nearly two years ago. Soon after they separated Bessie was married. Her marriage was anything but a success and she has since become "very nervous." Without her assistance Harry has been unable to direct his career and he has abandoned himself to homosexual activities.

CASE III. *Rebellion Against Paternal Standards and Discipline. Attitude of Defiance Toward Masculine Aggression.*—Nellie Kirwin is a successful, middle-aged business woman who has devoted much of her energy struggling against paternal domination. In recent years she has succumbed to the charms of a decidedly boyish girl young enough to be her daughter. In her business associations Nellie is a shrewd, well-informed woman. Hard lines form in her face when she speaks of making money and of getting the better of other people but a mawkish softness is evident when she speaks of her young lover.

The paternal grandfather was a conscientious, frugal, puritanical and exceedingly stubborn executive who exercised a baleful authority over his children and prevented them from marrying until late in life. The grandmother was God- and husband-fearing, mean and unpleasant. For many years as a widow she perpetuated the influence of her husband. She was exceedingly stern and rigid. In her later years "she sat beside the window with a clay pipe, silent. Everybody was afraid of her. As a child it used to appall me to see her children obey her. They were always cringing before her. My father, whom she never liked, took out on his children the bitterness and unhappiness which he had felt toward his parents."

The father was also aggressive, domineering and very stubborn but a totally irresponsible person. "He would rather gamble than eat and he doesn't give a whoop who pays his gambling debts." He was the first to rebel against his parents but did not marry until he was nearly 40. Although he rebelled against the puritanical standards of his parents he was just as rigid as they had been, in applying these standards to his own children.

Nellie had one paternal uncle and two aunts who were no improvement on her father. The uncle is described as a "sneakingly aggressive, very belligerent, little rooster type of a man. His reputation is one long string of petty meannesses. He would never do anything openly that would call for backing up his action with his fists." He did not marry until he was 50 and he kept his marriage secret from his mother for 10 years after that.

One of the aunts died a spinster at 82, a typical old maid school teacher type, very thrifty, masculine and domineering. The other aunt had similar characteristics and did not marry until after 50 to a widower, "a little old maid sort of a man," whose daughter was a Lesbian. Both aunts lived with and were dominated by the grandmother who was an invalid for many years before her death at 91. "It was a very strange house—the coolest feeling place—the kind of a place a youngster couldn't get out of fast enough."

The maternal side of the family was an exact counterpart of the paternal. The mother was a neurotic invalid most of her life, "very dainty, much interested in her personal appearance, always immaculately and beautifully dressed, the baby of her family." Two uncles and one aunt lived by themselves and exerted a negligible influence in Nellie's family background.

Nellie's maternal grandmother was an important factor in her rebellion. "She is the one person I have completely adored. The earliest memories I have are pleading to go and live with her. She spoiled me unbearably and I loved it. She was very feminine, soft and gentle. I was her favorite grandchild."

Nellie is the oldest of her siblings. She has three younger brothers. The oldest is "unbearably domineering. He and I get along like two strange bull dogs in an alley. After a month with him I'm just one jump from a straitjacket." The second brother "has a genius for well intentioned blundering in family affairs." Neither of these brothers drinks nor smokes. "They are good, conventional, narrow-minded people." The youngest brother makes speeches for the labor movement but is thoroughly cowed by his wife. "He and I are the bad eggs of the family. He smokes and takes a drink."

With this family background it is not surprising that Nellie followed a somewhat radical course. As she grew older she became more and more aware of the motivations of her behavior. "I know how much in me is based on rebellion. I think that was the springboard off which I leaped. I was the oldest. Pop took his practice on me. I got a good many beatings from my father." "Mother never confided in any of us. She was outraged when we made a noise. When my brothers got the best of me I would scream. As soon as they got big enough to dominate me life was just unbearable. I fought with boys like cats and dogs. I must have been an awful brat. Mother

would tell Pop and he would punish me. She said that every time she tried to punish me I would just laugh at her."

Nellie's reaction to her first menstrual period was equally stormy. "I came down stairs screaming that I had been stabbed. I had been dreaming of a knife shaped like a sickle cutting my head off." She had no preparation for menstruation. "Mother would blush and stammer if I ever mentioned such things. It was an awful shock. I thought it was atrocious to foist that on any human being. I was going to kill myself if that was going to happen every four weeks. I had no idea where children came from. The little girl around the corner told me that a baby came from the stomach and that the doctor cut you from the chin to below the navel. I vowed I would never have a child and I never did."

Nellie had been in the habit of confiding in her grandmother regarding affairs in the home and was encouraged by her to leave home at the earliest opportunity. She was never on good terms with her mother. "I used to tell my mother I must have been left on her doorstep and that I was sure I got in the wrong family because I had so little in common with any of them. Mother wouldn't let me bring children in the house and wouldn't let me visit them. She wouldn't let me bring boys home."

Nellie had always associated with boys just as though she were one of them but she had no sexual interest in them. Her father, however, had a quite different impression of her interest in boys. "He had a fixation. He was sure I had been out behind the barn. He even took me to a doctor to see if I was a virgin. It made me feel awful—I couldn't hold my head up."

This visit to the doctor occurred when Nellie was 17. A short time before this her favorite grandmother had died. "When she was dying she said the thing for me to do was to strike out for myself." The examination by the doctor was the final blow and at four o'clock the next morning "I walked out of the house. I didn't let my father know where I was until I was 30."

Soon after Nellie left she decided she would find out what a sex experience was like and did. It was painful and not repeated for several years. She had no romantic attachment until she met her husband at the age of 27. "I never intended to marry and I was astonished when I did. I never wanted to get into a situation where I would be treated as my father treated my mother. My husband was a conquering hero one minute, and gentle and soft the next—like my father and mother—I got both of them in him. I think I fell in love with the feminine in him and when he turned masculine I couldn't take it. Three days after marriage I would have given my teeth to get out of it. No one knows what I endured with him for 15 years."

During this period of marriage her contempt for men and her desire for independence increased. According to her standards her husband was a complete failure. She continued with her occupation and "I outstripped him in everything." She finally left him when he established a homosexual alliance.

"I went away with a feeling of failure. I spent all my money, drank too much and became promiscuous. Every time I had sex with a man I would sit up and tell him how lousy he was. I got a kick out of insulting the poor brutes. I was trying to build up my ego by tearing someone else down."

For many years she had no interest in life except her work. Her contacts with men merely intensified her feeling of antipathy. At 37 she became involved in a homosexual venture which was unsatisfying. She had not previously been aware of such inclinations although she recalls that at the age of 10 she had a yearning to sleep with a little girl. "I just thought it would be fun to snuggle up to her."

Nellie's first complete homosexual relationship did not occur until she was 43. She was then pursued by a boyish girl, 10 years her junior. With this girl she finally succeeded in having an orgasm. This was a new experience to her. "I can't tell you what a triumphant feeling it gave me. I had felt that I was an inadequate person sexually. I went around for days with a feeling that I was adequate at least to that extent."

For some reason Nellie was unable to obtain satisfaction again until two years later when she met her present lover. During the first year that they lived together this girl dressed herself as a boy and was introduced as Nellie's son. "That satisfied all my maternal complex. She is more aggressive. I have to be passive. I have to behave myself. She is the dictator of the household. She has a most sensitive skin. I never saw her undressed. She couldn't bear being handled naked. I never really enjoyed sex until I met her. She is like a giant at night and a little child in the day. For the past year I haven't cared much whether I worked or not. I'd much rather be playing with this youngster."

CASE IV. *Disillusioned in Marriage. Finds a Substitute in Homosexual Liaison.*—Mary Jones is a successful negro actress who is now nearly 50 years old. She is well adjusted to her actual situation in life and has no regrets for having established homosexual relationships. She is at ease in any social group. Her soft, deep voice, friendly attitude along with an evident personal security has caused her to be sought after by both white and colored people.

Mary has little in her early life which she can look back upon with pleasure. She was an illegitimate child, the daughter of a 12-year-old colored nursemaid and of a white man in whose home her mother was employed. Her grandmother also was the illegitimate daughter of a colored woman and a white man. Mary's skin was of such a light color that she was conspicuous in a colored neighborhood where other children called her a half-white bastard.

Both the mother and the maternal grandmother were married to colored men after their respective children were born. Mary's step-father was much older than her mother of whom he was very jealous. He used to beat up the mother and this relationship added much to Mary's unhappiness as a child. Her mother really seemed more like a sister and as a matter of fact in early childhood Mary had been led to believe that her grandmother was her mother.

Mary's early training, especially her moral training, came from her grandmother. "I've always been lectured about virtue. If I were not good my

grandmother said she would come back and haunt me." As a result of this training she remained a virgin until after her marriage. Precept was in marked contrast with the example set by her mother who was consistently promiscuous. "When I was six I saw mother in bed with men. I remember mother putting rouge on her cheeks. I cried and cried because I thought only bad women did that."

Even the associations with the grandmother were painful because when Mary was three her mother's step-father in a fit of jealousy killed a man who wanted to marry her mother. "That's one of the things that made my childhood so unhappy. My grandmother used to take me to prison to see him. He was in prison for life. All the children said my grandfather was a murderer."

The grandmother died when Mary was 13 and she was then turned over to a maternal aunt, Louise, with whom she had been living part of the time. The influence of Aunt Louise could hardly be considered desirable. "She was very stingy. She used to make me feel that I ate too much. She was very critical of me. She always prophesied that I was going to be a bad girl."

Three years later Mary was married to the spoiled son of a wealthy, self-made negro. She was not especially in love with him but she and her family felt that she should not neglect this opportunity for advancing her social position. The marriage proved to be a failure. Her husband never worked, drank to excess, gambled and frittered away whatever income they had. She was entirely dependent upon her father-in-law for support. She tried to be a good wife to her husband and to influence him to give up his dissipated mode of living but her efforts were of no avail. Two pregnancies were terminated by abortion because she felt she could not afford to have children.

Five years after marriage Mary had become thoroughly disillusioned but "I put up with him until after mother's death." The mother developed general paresis and Mary tried to take care of her. Even after she had to be taken to a state hospital Mary made daily visits. Her husband's dissipation gradually increased and shortly after her mother died he developed tuberculosis. She returned to him to nurse him until his death.

At 28 Mary was a widow and employed as a demonstrator. The manager of the firm was a dour, taciturn and indifferent man. She had never encountered an individual of this sort and she was fascinated by his indifference. She took the initiative in their courtship and marriage. They have been married for more than 20 years now and she has never succeeded in getting him to offer any expression of affection for her. "He would lose some of his manliness if he made such an admission." For many years after marriage she believed he was faithful to her but he was in the habit of staying out all night without explanation and she learned that he was interested in other women. This made her very unhappy. Although no contraceptive measures were used she did not become pregnant by her second husband. "I regret having no children. It's the one great unhappiness, particularly as I feel I would have made a very good mother."

Soon after Mary remarried she took part in amateur theatricals. Her unusual talents were soon recognized and her promotion was rapid. Her husband was jealous of her professional success but in recent years he has been dependent upon her for support.

Her prominence in theatrical work probably made her more attractive to women. She says, however, that all her life women had made advances to her but she would not consent "because it all seemed unnatural and abnormal." Finally at the age of 41, while dancing with a woman, "something very terrific happened to me—a very electric thing. It made me know I was homosexual." Since then she has had several alliances with both white and colored women and for the past five years she has been living with a white woman. This woman is "one of the finest women I have ever known. She has come to be very, very dear to me—not just for sex alone—it's a very great love." Mary has no regrets for having yielded to homosexual temptations. "This last relationship affords a tenderness I have never known." Nevertheless she believes she would have remained a conventional married woman if her second husband had not neglected her. "If marriage had been satisfactory I would never have had homosexual relations."

Discussion.

In the four cases which I have just cited only such details in the life history are included as are necessary in calling attention to the varied clinical picture presented by homosexuals and to the multitude of factors which contribute to a homosexual development.

The first case calls attention to the possible result of a lack of effective males in a family, especially the lack of virility in a father which the son might incorporate in his own ideals. Through the early death of his father he was not only fatherless and dependent upon a feminine version of masculinity but he was completely submerged first by his maternal grandmother and then by his mother. His early attachment to his mother was a source of his later ambivalent feeling toward her when she aroused his antagonism and his critical attitude toward her dissipation. She was completely beyond his control and too mercurial to permit him to develop a sense of security with her. His experience with the women in his family instilled in him a feeling of fear or at least caution and uncertainty.

It appears that he was unable to deal with whatever his mother symbolized except through identification with her and as soon as he escaped from her immediate influence he was governed by this identification. He then began to drink to excess just as she

did and he likewise became promiscuous. He was afraid of women and managed to avoid them. Being accustomed to domination and being essentially passive in his attitude he sought the companionship of older and stronger men.

As time passed he gradually reestablished an emotional relationship similar to that of his childhood. His greatest homosexual attraction was for an older man who, like himself and the other male members of his family, was incapable of maintaining a masculine relationship toward women. This man also was under the domination of two women. When the man failed him through their influence the feeling of futility in struggling against women drove him to attempt self annihilation.

His present emotional relationships seem to provide what he lacked in childhood as well as an opportunity to give free expression to his sexual desires. He lives with and is sheltered by a devoted, indulgent mother substitute. He follows the pattern of his actual mother in drinking and in sexual promiscuity. Through the failure of another man to achieve an adult heterosexual adjustment he has found in his sister a boon companion in unconventionality. Sought after because of his social and homosexual charms he obtains adequate libidinous gratification and there is no threat to his security because of the tolerant, platonic attitude of his sister and of his mother substitute.

In the second case the only son was from early childhood at the mercy of a dominant, aggressive older sister. He grew up in an environment of females with the exception of his father who was despised and pitied. The sister usurped the place of the mother by exercising discipline over him and commanding his respect and devotion. He was entirely dependent upon her and when she led in a rebellion against the parents he was merely a passive agent carried along in the wake of her determined action to free herself of parental restrictions.

Like an adoring mother she spoiled him and gained his affection by giving him presents. She watched over him and even asked him about his sexual habits. His passivity probably made him an easy victim of older boys and men who solicited him for sexual purposes.

By the time that he and his sister might be expected to be negotiating adult psychosexual alliances they avoided an obvious

incestuous relationship by substitution. She shared her girl friend with him and submitted herself to a boy with whom he had already established a homosexual alliance. He then behaved toward her as though she were his possession and when he failed to divert her from his rival he abandoned himself to promiscuous homosexual affairs. Even this partial emancipation from her could be achieved only through alcoholic intoxication.

The third case illustrates the personality distortion which may result from the rebellion of an aggressive daughter against excessive masculine domination of her paternal relatives. It is probable that she was motivated just as much by the helpless passivity of her maternal relatives. She was in sympathy with the rebellion of her father against his parents but this made her resent all the more his domineering, meddlesome treatment of herself. Her feeling against him was intensified as she grew older and realized his inconsistency. To her hatred was added a feeling of contempt because of his self indulgence and irresponsibility.

From early childhood she was consistently rebellious against any form of masculine aggression. She behaved as though she herself were an active, aggressive boy accepting any challenge to her security. Throughout her childhood she evinced none of the interests which usually occupy the attention of a girl and she vowed that she would never submit to what appeared to her to be the impositions upon womanhood. She enjoyed the distinctly feminine characteristics in her mother and maternal grandmother but only as a boy does.

With this background she was poorly prepared to undertake a heterosexual adjustment and experimentation not only convinced her that she could not experience pleasure in this way but that she was justified in her contempt for men. Her marriage was impulsive and the result of the appeal which the feminine qualities in her husband made to her. It was a failure to the extent that he manifested masculine sexual qualities in their intimate relations. She feels that she was disillusioned in him because of his inability to succeed in his profession although fundamentally she could not have tolerated being surpassed or even equalled by him. It appears that she sought in her husband the feminine qualities of her mother. She hoped to train him so that he might be able to support her, to be

a responsible person or to have certain desirable qualities which her father lacked.

With the complete failure of her experiments and the realization that her efforts at marital adjustment were fruitless she was ready to accept a homosexual compromise. In her present alliance she has in one person a child who is dependent upon her for support, a passionate boy who fascinates her, a girl who is delicate and modest like her mother, a lover who makes practically none of the masculine sexual demands upon her. In fact it appears that she identifies this girl with herself and that her pleasure is in large part narcissistic.

The contrast of the personality in this case with that of the Negro actress, the fourth case cited, is so great that there appears to be little in common. The actress was exposed to a continuous series of emotional stresses which might be expected to cause gross personality distortion. All of her relatives prophesied that she would never amount to much and that she would become a bad woman. There was little in her family background to justify any other conclusion. There was no one with whom she might have identified herself and thus avoid the downward course in life which had been predicted for her. In spite of all these handicaps she now has the emotional attributes of a kindly mammy, regretful that she does not have children of her own, and in addition she has achieved success in her profession.

Even though she felt no great affection for her first husband, mutual physical charms and her sense of loyalty would have made her first marriage successful if he had not been so alcoholic and irresponsible. In her taciturn, apparently self-sufficient second husband she probably expected to find security. This proved to be another illusion. Her success as an actress made her socially and economically independent. People then began to express their appreciation of her personal charms and she was pursued by many admirers. The rigid moral code which she had followed from childhood prevented her from accepting the attentions of men.

Having the desires of a mature, healthy woman and with the fading chances of being satisfied by a jealous, unfaithful husband it is not surprising that she experienced a thrill from the embraces of a passionate woman. She was impelled by a feminine desire to serve a lover who took the initiative in expressing affection for her.

She was troubled by the feeling that homosexual relations were abnormal and she doubted the constancy of a woman. She was especially skeptical of her present lover because white women are reputed to be less faithful then the colored. This lover's persistence and sincerity gradually overcame her resistance and she is at last enjoying a relationship in which tenderness and devotion are of prime importance with sexual gratification as a natural accompaniment.

In view of the observations made in these four cases it is evident that the overt homosexual is like any psychiatric patient in that his condition can be understood only through detailed information regarding the personal and family background of each person under study. Personality forces and human interrelations contributing to a homosexual development cannot be traced to their ultimate sources but it appears that the more closely a relative or friend is associated, especially in childhood, the more direct and decisive is the influence exerted. This means that the parents are in most instances chiefly responsible for the homosexual developments in their children. The parents in turn may have been distorted by the grandparents. Anyone taking the place of a parent must assume responsibility for the development of homosexual tendencies just as he does for the development of other personality characteristics.

It is necessary therefore that the parents keep themselves informed regarding the interests which servants and relatives may have in children. Not uncommonly a nursemaid, a sibling, a cousin, an uncle or an aunt may be involved in the distortion of a child's psychosexual development. It appears that boarding and noncoeducational schools are more likely to favor a homosexual development. It is generally recognized that any segregation of the sexes is likely to bring about overt expression of latent homosexual desires.

Whatever these external influences may be the majority of persons do not succumb to them and the minority who do succumb, appear to be fundamentally predisposed. Some of this predisposition may be inherited through the germ plasm but in the cases studied thus far it is rare to find overt homosexuals in more than one generation. The tendency may nevertheless be inherited because the difference between latent and overt homosexuality is

often very slight. Undoubtedly there are many instances of overt homosexuality in the family of which the informants are unaware.

In a large majority of the cases the tendencies to homosexuality as shown by attitude and behavior can be observed in early childhood. Much of this may be constitutional but there are many other determinants. For instance the attitude of parents toward the sex of an expected child may be an indication of the influence which they will exert on that child. If a girl is wanted and a boy arrives the child may be treated as though he were a girl. The child senses the wishes of the parents even though nothing is said. His habitual conduct is likely to be that which elicits greatest praise or distinction. To the extent that his interests, attitude and behavior are out of harmony with his actual sex he is likely to meet with circumstances which will accentuate his deviation.

Boys appear to be somewhat more vulnerable than girls and if they show undue feminine tendencies special care should be exercised to give them opportunity to develop masculine characteristics. A boy should not be repeatedly exposed to situations in which he will be defeated and he should not be applauded for his ability to display himself in female attire.

Under ideal circumstances the father should be an understanding, tolerant but virile and decisive male. The mother should have the gentleness, patience and passivity usually associated with womanhood. Any mixture such as an effeminate father and an aggressive, masculine mother is likely to be disconcerting to the child and accentuate homosexual tendencies.

Much of the friction between the parents of homosexuals seems to be due to the inability to make an adjustment of aggression and passivity, of masculinity and femininity. Friction between parents is so common that it is difficult to associate it with homosexuality in a child but in the cases which I have studied gross maladjustment was almost universal.

Most of the overt homosexuals have engaged for several years in some form of sex play with their own sex before they recognized their own homosexual tendencies. It is very difficult for them to get any accurate information because the subject is officially tabooed and the veiled or jesting references to it do little more than stimulate curiosity. Often misinformation is given. One young man

was assured by a physician that he could not be a homosexual because he had a masculine distribution of pubic hair. He now holds this physician responsible for the further development of his homosexual tendencies.

In addition to the predisposition which a person may have in a homosexual direction his tendencies are likely to become overt in proportion to the obstacles which he encounters in attempting a heterosexual adjustment. If the first heterosexual experience is especially unpleasant, painful or unsuccessful there may be great reluctance to repeat it. If there is much discrepancy between the desires and capacities of the man and the woman either one or both may be driven to other means of gratification. One man had been satisfactorily married for several years and then became impotent when his wife began to take the initiative and particularly when she demanded that he impregnate her. They were divorced a year later and he then engaged in overt homosexual practices.

As homosexuals grow older they tend to seek younger companions. A middle aged man may employ a young adult to live with him to satisfy his vanity. It gives the impression that he is still so attractive that he can hold the affections of a young man. The age discrepancy is also a factor in the seduction of the young and inexperienced. This is especially true with women because intimacies between them are tolerated and the significance of the subtle approach of an experienced woman usually is not comprehended.

The attitude of society toward homosexuality is of course an important factor in its development. Few persons escape an overt homosexual experience at some period in life and desires are universal. The rôle which such experiences and desires play in the further development of the normal, the homosexual, the neurotic and the psychotic is not clear but it appears to be dependent upon the kind and amount of repression and the associated conflict. The so-called well adjusted homosexual is not without conflict which he may learn to conceal by bravado or express in his defiance or his contempt for conventionality. Many sincerely believe that a homosexual adjustment is normal for one so inclined provided it is kept a personal matter and doesn't involve others who are not homosexual.

Homosexuality is wide spread and involves all classes of society. As our western civilization grows older homosexuality appears to be increasing. A century ago in this country children afforded the greatest security to the parents. With out present mode of living children are among the greatest liabilities to the parents. As a result young people are driven more and more to find substitutes for adult heterosexual relationships. Homosexuality is merely one of those substitutes. An intelligent attitude toward this problem is not possible unless it is studied and understood. Psychiatrists are best qualified to make this study. Such a study is worth while not only on its own merits but also for the additional knowledge which it will give of psychoneurotic and psychotic distortions.

Conclusions.

1. The psychogenic factors in overt homosexuality vary so widely that they should be studied in each case.

2. This study should include a detailed investigation of the emotional relationship within the family as far back as the generation of the grandparents.

3. This study should include also a detailed personal history with special attention directed to attachments and aversions along with their environmental setting.

4. Well adjusted overt homosexuals are rare.

5. A large proportion of the cases appear to be so predisposed by constitution and environment that a homosexual adjustment seems inevitable.

6. A large proportion of cases drift into a homosexual adjustment because the obstacles to heterosexual adjustment have been overwhelming.

7. The value of therapeutic assistance can be determined only after a careful study has been made of each case.

8. A large proportion of the cases could have been prevented.

9. Prevention involves eugenics as well as the mental hygiene of the predisposed individual and his family.

10. Overt homosexuality deserves the serious attention of psychiatrists both on its own merits and for the additional insight which it gives into the understanding of recognized personality disorders.

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DISCUSSION.

Dr. E. E. Mayer (Pittsburgh, Pa.).—There is nothing necessary to add on the scientific side to the paper of Dr. Henry. However, having been impressed for many years with the sociologic importance of homosexuality, I wish to thank him for his presentation of this subject. In the Municipal Mental Health Clinic of which I have charge, many homosexualists present themselves, some with and some without court order. The latter come as a rule voluntarily and seeking treatment largely because of various neurotic conditions. The homosexual drive as might be expected is not often the conscious reason for consultation. Dr. Henry has rightfully emphasized the importance of psychogenetic factors. There is no practical aspect in considering homosexuality from the standpoint of a biological defect, or of misdirected hormone activity, or of residuals of primitive cults inherent in certain individuals.

Overt homosexualists generally reveal in their analyses a hostility to the family situation and their homosexual drive is frequently an aggressive attempt to compensate for unwholesome father or mother relationships. The episodes may vary, but the psychogenetic factors are remarkably similar.

The sociological importance of this subject although recognized is too largely ignored. The situation in many schools and colleges is such that I wish a paper like that of Dr. Henry's could be widely disseminated. It is not altogether an individual problem as is too largely assumed, and attention has rightly been called to the social aspect.

Dr. Ben Karpman (Washington, D. C.).—I agree with Dr. Henry with reference to the importance of homosexuality. Allowing for certain exaggeration, it might be said that the problems of psychiatry will not be solved until we solve the problem of homosexuality. Allowing fully for the constitutional basis there is no doubt about the significance of psychogenic factors in homosexuality. I have, however, a few suspicions as to some of the statements made by Dr. Henry. He points out, apparently as throwing light

on the development of homosexuality, those instances of boys brought up in families of 4 or 5 women and draws the conclusion that under such circumstances it seems quite natural for such boys to develop into homosexuals. Unfortunately, Dr. Henry does not provide us with controls from the normal population, or he might have come across cases where there was one boy in the family brought up by a number of women, who nevertheless has developed normally. I recently had under care a woman who had a definite neurosis; history showed that two of her sisters were also neurotic. There were also in the family another sister and a brother who appeared to have escaped any psychic injury. Besides them, there were a mother and a couple of aunts in the family. Yet the only boy in the family escaped the neurosis and is making a good adjustment. I know the case of another man who was the eighth child in a family of seven girls. The father made up his mind he must have a boy, no matter how many children there were in the family. This boy, the eighth child, is now a physician, a psychiatrist. There is nothing homosexual about him. How did he escape the influence of eight women in the family?

Another proof of need of control is the instance cited by Dr. Henry of parents wishing to have a boy or a girl, influencing the subsequent development of the child. I think there is some truth in that for I have seen cases of this kind. Yet I also know instances where the parents would want to train the boy as a girl and the boy would balk and refuse, developing normally. There comes to my mind the case of Pearl Berger, the notorious strikebreaker, whose parents so strongly wished to have a girl that anticipatorily they named the child to come Pearl. So far as I know he is considered one of the biggest roughnecks in the United States and if there is anything homosexual about him, it is certainly well concealed.

I should like to take issue with Dr. Henry in his treatment of homosexuality as a group. This is I believe a mistake. There is such a wide diversity of types that seemingly they have nothing in common except that of homosexual behavior. There are among them a great many individuals who never had heterosexual experiences. Again, at the other extreme end of the group, there are individuals entirely heterosexual but who have had on one or two occasions a homosexual experience. To group all these people together merely on the basis of homosexuality is, for the present at least, fictitious. We need a finer differentiation and sub-grouping.

I should like to ask Dr. Henry whether from his observation and study there is such a thing as a normal homosexual? If one accepts the psychogenetic concept that we are all bisexual and that we become heterosexual because we repress the homosexual component, then equally, one cannot become homosexual unless he represses the heterosexual side, which means neurosis.

I should like to ask Dr. Henry how he obtained his material. I do not feel that he used the straight psychoanalytic approach because I do not get in his cases the type of material and interpretation that one associates with psychoanalysis. If he has obtained that by the ordinary anamnestic approach

and asking questions, I feel that this carries a certain danger because unwittingly he is going to ask leading questions and get answers which color the material.

Dr. George Henry (New York City).—I am afraid I did not make myself very clear. What I wanted to emphasize was that homosexuals had to be studied as individuals. If there is any grouping, it only comes through the word "homosexual." Each homosexual is an individual unto himself. He has his own family background and his own personal background. Very few general statements can be made about homosexuals.

Whether the parents wanted the child to be of the opposite sex, or whether there are too many females in the family with respect to the males, or vice versa, are only details. I mentioned them as details. It doesn't matter so much how many women versus men there are in the family. The important consideration is what do the women do to the men? How are the men affected by the women, and vice versa? That is what I was calling attention to, not a numerical difference.

I do not know what a normal homosexual is. I think I might answer the question by saying that some individuals seem to develop naturally into a homosexual adjustment without evident conflict, without desire to be anything else, and quite contented to be what they are. Such persons are rare, at least in my experience.

All of these individuals are sent to me by a field worker who is personally acquainted with them and tells them about the study. By the time they come to me they are already prepared to talk and they understand exactly why they are coming.

I never ask questions unless it is absolutely necessary. I begin with the father, saying, "Tell me something about your father." If they proceed well without further suggestions, I let them talk. Now and then, I have to guide them a little.

After the pattern of the father is established, they talk pretty freely about the other members of the family. I take down in shorthand, verbatim, what they say, no matter what it is. I would say that I use neither a psychoanalytic approach nor a questionnaire approach. If it approximates any recognized method I suppose it approximates the psychoanalytic method. It is a record of what they say spontaneously about themselves, with a little guidance. They are all responsible individuals, and I believe they are telling me the truth.

THE PSYCHOLOGICAL ASPECTS OF PHYSIOTHERAPY.

By WILLIAM C. MENNINGER, M. D.,
AND
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From our observations in the application of physiotherapy to persons with mental illnesses, the psychological effects of such treatment often appear to be the most beneficial influence in the procedures.[1, 2, 3] We are well aware of the physical benefits to be derived, whether the treatments are given for the purpose of sedation or elimination, stimulation or tonic effect. It is noteworthy, however, to the physician or nurse interested in the application of physical therapy in the psychiatric hospital that almost no mention of this very important feature of physiotherapy is made either in the periodical literature or the standard texts. Most of the recent papers on this subject (Hutchings,[4] Hoffman,[5] Black,[6] Palombo [7]) and even the excellent text by Wright [8] fail to give any specific attention to this feature of physiotherapy. Although Kindwall and Henry [9] attempt to evaluate the effectiveness of wet packs and prolonged baths, they make no comment on the specific point of the psychological influence; rather, they discuss the patient's attitude toward the treatment. Wallace [10] frankly states that it is the psychic attitude that has in part at least acounted for the success of health resorts and spas.

This failure to mention the psychological benefits to be derived from physiotherapy is the more paradoxical when one considers the very obvious facts of medical history and even of present day practice. The beneficial influence behind the King's touch, whether it was to cure scrofula or some other malady was entirely psychological. One must assume that all of the benefit derived from faith healers, and perhaps much of the benefit from the cults which use the laying on of hands, results from the psychological influence. To assume that a psychological effect is not present in physiotherapy

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as applied scientifically is obviously incorrect. In every instance the psychologic situation in physiotherapy furnishes two extremely important aides in helping the patient to get well. In the first place, the patient can see visibly that something is being done for him. The procedure, whether it is a bath or massage, ultra-violet light or an electric cabinet bath, impresses him because it is physical and because it comes in direct contact with him. Thus it means to him a direct approach to his physical self. Secondly, physiotherapy is effective in part because the patient becomes the center of attention in a very real way in receiving the personal ministrations of the physician or technician or nurse, and thus it satisfies in any individual an unconscious desire for self-love.

Such a contention as that stated by Palombo,[7] that physical measures bring about physical improvement and thus an increase in the general body function which in turn results in mental improvement, is true only in part. Such a statement cannot be entirely accepted by persons familiar with the treatment of mental illness, since in many instances an improvement in the mental picture results before any improvement takes place in the physical status. A typical example can be shown in a case of conversion hysteria in which the patient exhibits a paralysis which appears to the patient to be an organic condition, but which the physician may recognize has no organic basis. Such patients occasionally respond to physiotherapy and are relieved of their physical symptoms; the beneficial result is produced by the psychological factor and not by any physical means.

Furthermore, many mentally ill patients have no physical complaints whatever, and yet show a marked improvement in their mental condition after receiving physiotherapy. In such cases there can be no doubt that the psychological influence of the physical procedures has produced the chief beneficial effect upon the individual.

Psychiatric hospital treatment has progressed to a point where the needs of each individual serve as the criteria for the treatment prescribed. The psychotic and neurotic symptoms represent a conflict in which he is striving to meet certain unconscious emotional needs.[11] Such a need whether it be a demand for love, for an outlet for hate, for an atonement for guilt or any other need, can be specifically prescribed for in the total plan of activity of the patient, in occupational therapy, in recreational activities, in his ward management, and we

believe also in physical therapy. Consequently, in addition to prescribing for the physical demands of the patient in his physiotherapy treatment, it seems desirable also to consider the psychological demands, namely, the unconscious emotional needs which the patient exhibits. We shall report very briefly some observations as to how physiotherapy can meet these unconscious emotional needs.

Opportunities Afforded to Meet Unconscious Emotional Needs.

The symbolic significance of physiotherapy for mentally ill patients is very important, and should be considered in order to get the best results from the treatment. To determine just what the symbolic significance of the various treatments is may be very difficult; usually the expressed attitude of the patient is only one of fear or of liking for the particular treatment.

Upon observing the fear manifested by one patient towards the ultraviolet light, special efforts were made to establish closer rapport with her, so that we might discover the reason for this fear. Through the use of suggestion she came gradually to accept this treatment, and after several months she told us of her fears. She had thought that all the beds in the institution were to be charged with a high voltage of electricity and that the ultra-violet light was the huge dynamo to be used. The fact that she gradually learned to accept the situation and was able to discuss her fears with others shows that physiotherapy helped to bring her in closer contact with reality, not through the physical effects obtained but through the psychological effects.

Opportunities Afforded for the Patient to Obtain Love.

In many psychiatric patients the need for attention, praise, special consideration—in short, their need for love—is a conspicuous unconscious need. The ways in which the physiotherapist may help such patients obtain these various forms of love depend largely upon the personality of the therapist. She may praise their achievements and use every available opportunity to foster a positive attachment on the part of the patient. The results may be expressed in the patient's improved behavior and in helpfulness.

In the case of one patient who gave a history of having had several cystoscopies performed, though without organic findings, the outstanding symptoms were attacks of abdominal pain and extreme nervousness, accompanied by attacks of hysterical crying. Doses of narcotics and whiskey were the only methods she had found to obtain relief. Upon her admittance to the physiotherapy department her pain was very acute and her abdomen very sensitive to touch. After several treatments with the infra-red light and by hot and cold fomentations some improvement was observed.

On her first few visits the patient was very shy and did not offer to converse with anyone. Gradually the therapist was able to establish a closer rapport with her by giving the patient her undivided attention, and by being very kind, patient and sympathetic. The patient gradually learned to accept the services of the nurses, became very talkative and pleasant and would often remark that she had forgotten that she was receiving these treatments in her interest in learning to know the nurses and observing the surroundings and the numerous other treatments being given.

After several weeks of treatments she remarked one day, "The light is the only thing that has helped me since I have been here, and to think of all the pain I have suffered before. If I ever feel the pain again I shall come right back." In view of the fact that her symptoms were probably entirely functional in origin and that these particular mechanical measures could at most have had slight physical effect, one can assume that the improvement was the result of the psychological effect which this particular treatment had upon her. It was apparent that she wanted love and attention and after the gratification of receiving it in her treatments there was no further need for the physical complaints which had been used unconsciously as a means of obtaining the love.

Another example of the benefit of physiotherapy in affording the patient love was seen in an elderly gentleman who had come with his wife from a European country; they had no children. They lived in the hope of returning to their home but during their struggle to be able to do so they evidently had no time to make friends or to be attentive to each other and lived a very secluded life. The patient's concern for himself was so great that physical complaints and ailments were used to obtain attention. He had gone to several physicans who told him that he had no organic pathology of the

intestinal tract which would cause the symptoms of which he complained; they recommended that he seek aid in a psychiatric sanitarium.

It was noticed that he lingered in this department every day. He received hot and cold fomentations and auto-condensation treatments. These particular treatments required a great deal of personal attention upon the part of the nurse or therapist which noticeably satisfied him, but he continually asked for even more attention; insofar as it was possible this was given to him. Within a relatively short time under these treatment procedures he showed very noticeable improvement. It is presumed that this improvement may have been in part the result of the physical manipulations, but more likely it was the result of the special attention that he received. This instance illustrates the typical situation in which the patient receives a great deal of individual attention from the therapist, and he can thus give up his physical complaints as a form of demanding attention.

Opportunities Afforded to Relieve a Sense of Guilt.

An example of treatment in the physiotherapy department through which guilt may be attoned for, is that of the electric cabinet bath. This is prescribed for some depressed patients; tactful suggestions and some persuasion may be necessary to encourage them to submit to the procedure. After the treatment is completed the patient feels much better and does not appear to be so depressed. It has been a " punishment " for him to remain in a very warm place for eight to ten minutes. This serves as an atonement for his guilt and relieves him of the need of seeking punishment; for this reason he is less depressed.

The acting out of the wish to die as a need for punishment is very often seen in patients in response to cold wet sheet packs. In the treatment of one patient who had received various treatments for a long period of time, a wet sheet pack was ordered several times a week. During the first treatment the patient was very restless and irritable and received no benefit from it. After several packs had been given he became less restless, complained less about being wrapped so tightly and would relax and sleep. One day he told us that the pack resembled the manner in which a body was prepared

for burial. It is possible that the symbolization of the pack permitted him to act out the wish to die, and thereby produced the desired results.

Another interesting example was that of a very aged lady who insisted that she was in a trance. When she was taken to the physiotherapy department daily she always asked to have a pack. She would say, " Just give me a pack so you won't have to spend much time on me, and in a pack I will be able to stay in the trance." This was probably not the real reason for wanting the pack, but possibly it permitted her to act out her wish for self-punishment.

Another point of psychological importance in physiotherapy procedures is concerned with the use of the electric cabinet bath. A great many patients believe implicitly, regardless of what their difficulty may be, that anything that causes them to sweat so profusely gets rid of a great deal of " poison." As a consequence they place a great deal of faith in this form of treatment, the results of which depend, however, on the illusion that some unknown toxin has accumulated in their bodies and caused them to be " nervous." One can probably assume that in some degree this procedure serves as a mechanism in the psychological sphere which reverses some previous experience or situation. The patient may unconsciously feel that by this form of punishment he can " undo " a previous transgression; thus he " gets it out of his system."

Summary.

The psychological effects obtained from physiotherapy depend largely upon the personality of the therapist, her understanding of the psychologic needs of the individual and her ability to direct therapy to meet these. In the treatment of mental diseases the value of physiotherapy results only in part (probably a minor part in some instances) from the physical effects but rather from the psychological effects which it produces.

The fact that all mental institutions, no matter how small, have some kind of a physiotherapy department gives one an opportunity to stress the point that physiotherapy is of great help in producing improvement in mentally ill patients.

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OBSERVATIONS ON THE CIRCULATING BLOOD VOLUME IN SCHIZOPHRENIA, MANIC-DEPRESSIVE PSYCHOSIS, EPILEPSY, INVOLUTIONAL PSYCHOSIS AND MENTAL DEFICIENCY.*

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AND
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Elgin.

In a systematic investigation of the structural variations from normal present in patients with dementia præcox, estimation of the circulating blood volume follows logically researches on water balance [1] with its derivative findings of weight variations,[2] the clinical evidence of disturbances in vasomotor tonus, the findings of a low oxygen consumption rate,[3] defective heat regulation [4,5] and structural inadequacies of the circulatory apparatus.[6]

Before presenting our experimental data and examining them for possible conclusions it is pertinent at this point to state briefly what we wish to convey by the term "structure" when we speak of structural variations from normal in patients with dementia præcox. Specific changes in brain structure have not yet been demonstrated in schizophrenia. Our conception of structural variations is not limited to extreme changes that may be revealed by histopathological technique. The findings of defective heat regulation, for example, in schizophrenic patients is a structural variation, although gross anatomic changes in the centers for heat regulation may be undemonstrable with our present technique. The cause of the defective heat regulation which is demonstrated by physical or physicochemical methods must of necessity be a defect in the structure of the apparatus involved in heat regulation or defective relationship

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between the various parts of the apparatus. The second alternative —defective relationship—due probably to disturbances in innervation, also involves structural changes. In other words, function, whether normal or defective cannot be divorced from structure.

The concept of structure as applied to mental disorders is limited to the meaning implied in the relation of a given bodily condition to psychologic laws. The disordered thoughts and feelings in dementia præcox are mental events in a physical universe and are accompaniments of disordered physiological relations. This conception of structure is an attempt at a working unification of the so-called mind-body problem. There are numerous psychological investigations of the mental symptoms in dementia præcox that are concerned with formularized interpretations of latent or manifest motivations underlying delusional expressions in which the parallel brain and body changes are totally ignored. On the other hand, physiological studies in mental disorders frequently ignore the psychological aspect, only occasionally concluding with a reference to a disturbance in homeostasis with its teleological implication of "wisdom of the body."

The volume of the circulating blood depends, among other factors, on water balance, capillary pressure (hydrostatic pressure), colloid osmotic pressure, stasis, posture, basal metabolism, external temperature, velocity of blood flow, rate of absorption of water from the gastrointestinal tract, vasomotor tonus, particularly of the capillaries, atonic and inactive capillaries contributing to a greater storage of blood in the spleen, liver and subpapillary plexuses of the skin, with less blood available for the active circulation. Blood volume also varies to some extent with age, sex, weight and proportion of body fat.

Material and Method.

The circulating blood volume was estimated in 78 female patients who included 39 with dementia præcox, 15 with manic-depressive psychosis, 6 with epilepsy, 7 with involutional psychosis, 7 with mental deficiency, 2 with paranoid state, 1 with psychopathic personality and 1 with senile dementia. The schizophrenic patients were selected from the receiving service where the acute type of disorder predominated, and from the chronic service. The ages of the patients with dementia præcox were, with several exceptions, be-

tween 20 and 30 years. The patients with manic-depressive psychosis had similar age distributions. The schizophrenic patients included the paranoid, hebephrenic, catatonic and several undetermined types. The patients with manic-depressive psychosis included those with the depressed, manic and mixed phase.

Brilliant vital red dye was used for blood volume determinations. A 1 per cent solution of brilliant vital red was made up in freshly distilled water. A 1/267 per cent standard brilliant vital red solution and an isotonic 1.6 per cent solution of sodium oxalate were prepared.

A needle was inserted into one of the antecubital veins without stasis and a sample of blood was withdrawn. Through the same needle a known volume of the sterile 1 per cent vital red solution (about 1 cc. for each 5 kilos of body weight) was introduced and washed in with a small amount of sterile saline. The needle was then withdrawn from the vein. After an interval of four minutes a second sample of blood was taken from a vein of the opposite arm. Each sample of blood as soon as it was taken, was transferred to a graduated centrifuge tube containing enough isotonic oxalate solution to make a mixture of about 1 part oxalate to 4 parts of blood.

The two centrifuge tubes were then whirled for 30 to 45 minutes at 2000 to 2500 r. p. m. The volume of red cells and the total volume of the blood plus oxalate in the tube containing the dyed blood were read off.

Two cubic centimeters of the dyed colored plasma were removed and diluted with 4 cc. of 0.9 per cent Na Cl solution. This mixture was compared in the colorimeter with a standard prepared by mixing equal volumes of 0.9 per cent Na Cl solution, standard vital red solution and uncolored plasma. The results were then calculated.

A Comparison of the Circulating Blood Volume in Dementia Præcox and Manic-Depressive Psychosis.

In Table I are given the distribution values for blood and plasma volume and per cent red cells in schizophrenia and in manic-depressive psychosis. The average circulating blood volume in schizophrenia is 3917 cc. as compared with 4573 cc. in manic-depressive psychosis. The average plasma volume is 2145 cc. as compared with 2660 cc. in manic-depressive psychosis. The blood and plasma volumes in cc. per square meter of body surface are also significantly

lower in dementia præcox. The values were for blood volume, 2609 cc. in schizophrenia as compared with 2973 cc. in manic-depressive psychosis, and for plasma volume 1433 cc. as compared with 1727 cc. The per cent red cells was 45.2 in schizophrenia and 43.5 in manic-depressive psychosis. The comparison of the circulating blood volume on the basis of surface area is more reliable than on the

TABLE 1.

CIRCULATING BLOOD VOLUME, PLASMA VOLUME AND PER CENT RED CELLS IN SCHIZOPHRENIA AND IN MANIC-DEPRESSIVE PSYCHOSIS.

	Blood volume, cc. per sq. m. of body surface.			Plasma volume, cc. per sq. m. of body surface.			Red cells, per cent.		
	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.	Minimum.	Maximum.	Average.
Schizophrenia, 39 subjects	1947	3383	2609	1073	2186	1433	40.5	51.3	45.2
Manic-depressive psychosis, 15 subjects.	2121	3780	2973	1191	2276	1727	40.0	46.1	43.5

basis of body weight. However, the values per kilogram body weight were also lower in dementia præcox; the blood volume was 78.9 cc. and the plasma volume 43.3 cc. per kilogram as compared with 87.9 cc. and 50.9 cc. respectively in manic-depressive psychosis.

In a preliminary paper [8] we reported a low circulating blood volume in schizophrenia as compared with non-schizophrenic

TABLE 2.

A COMPARISON OF THE VALUES FOR BLOOD VOLUME IN SCHIZOPHRENIA AS GIVEN BY LOONEY AND FREEMAN [9] AND BY US.

	Blood volume, cc. per kg. of body weight.	Plasma volume, cc. per kg. of body weight.	Blood volume, cc. per sq. m. of body surface.	Plasma volume, cc. per sq. m. of body weight.	Red cell hematocrit readings.
Looney and Freeman..	79.3	42.6	2824	1509	46.1
Finkelman and Haffron.	78.9	43.3	2609	1433	45.2

patients. Shortly after we had begun our experiments a paper by Looney and Freeman [9] on blood volume in schizophrenia was published. Our findings confirm the observations of these authors of a low blood and plasma volume in schizophrenia. A comparison of the values determined by us with those estimated by Looney and Freeman are given in Table 2. The similarity between the findings

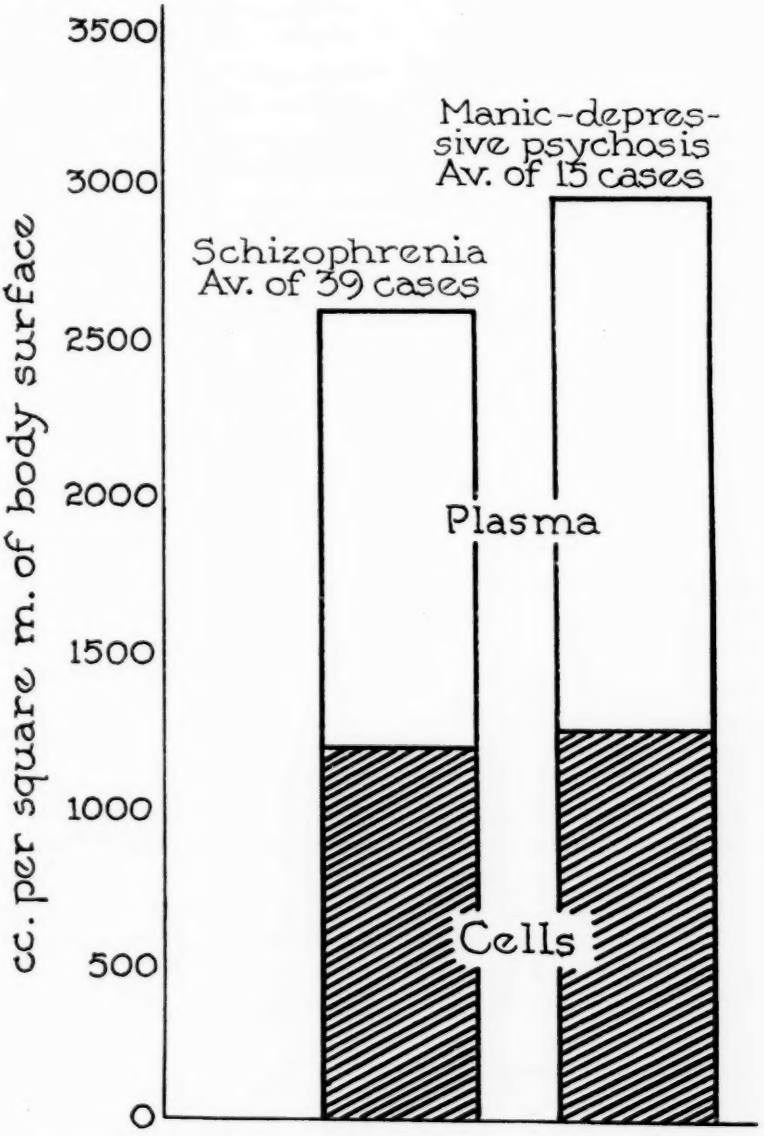

FIG. 1.—Circulating Blood and Plasma Volume in Schizophrenia as Compared with Manic-Depressive Psychosis.

of Looney and Freeman and ours is remarkable in view of the fact that our subjects were female patients and their subjects were male patients, and moreover, we used brilliant vital red dye, whereas they used congo red. Although our observations of a low blood volume in schizophrenia confirmed the findings of Looney and Freeman, our interpretations of the result are based on a different set of principles. Their explanation that a decreased demand of the tissues for oxygen results in a slowing of the circulation is a teleological explanation and is not any more satisfactory than stating the reverse that a decrease in oxygen made available to the tissues is the cause of the lowering of the basal rate of oxygen consumption. Explanations making use of the term " demand " stress temporal sequences and do not elucidate the processes involved. A diminution in the circulating blood volume and a decreased oxygen consumption rate in dementia præcox are closely related processes (as physiological mechanisms in general are interdependent) and not caused one by the other. Both of these structural changes (using the term structure in the sense already indicated) might be due to a disturbance in the hypothalamus. On the basis of hypothalamic dysfunction one may explain the subnormal metabolism, defective heat regulation, disturbed water balance and vasomotor disorders found in schizophrenia. A disturbance in water balance, vasomotor tonus and capillary permeability is reflected in an altered volume of the circulating blood.

The structural link between these physiological disturbances (defects in water balance, heat regulation, metabolism and vasomotor tonus) and mental symptoms should be sought in the central nervous system. The work of Bard [10] and Ranson[11] indicates that the hypothalamus is important in emotional expression. Stimulation of this region of the brain is followed by the physical signs of emotion and after a destructive lesion of the hypothalamus, the animal is incapable of emotional response. The characteristic apathy and lack of emotional response in schizophrenia, together with the physical findings mentioned, point to a disturbance in function of the hypothalamus.

The values for the circulating blood volume in manic-depressive psychosis are similar to those given for normal subjects by Rowntree and Brown [12] on the basis of body weight, but are lower on the basis of surface area. On the basis of surface area our values

for manic-depressive psychosis are similar to the values given for normal subjects by Looney and Freeman [9] but higher than their values on the basis of body weight (Table 3). Unfortunately, we

TABLE 3.

A Comparison of the Values for Blood Volume in Manic-Depressive Psychosis and in Normal Subject. The Values for the Normals Are Taken from Rowntree and Brown,[12] and Looney and Freeman.[9]

	Blood volume, cc. per kg. of body weight.	Plasma volume, cc. per kg. of body weight.	Blood volume, cc. per sq. m. of body surface.	Plasma volume, cc. per sq. m. of body surface.	Red cell hemato-crit readings.
Rowntree and Brown (normals)	89	50	3380	1973	42
Looney and Freeman (normals)	81.4	44.1	3007	1610	47.2
Finkelman and Haffron (manic-depressive psychosis)	87.9	50.9	2973	1727	43.5

did not have our own normal controls, but from a comparison of our values with those given by these authors, we conclude that the circulating blood volume in manic-depressive psychosis is probably normal.

The Circulating Blood Volume in Epilepsy.

We estimated the circulating blood volume in six patients with epilepsy. The number of subjects is too small to justify conclusions; we were primarily interested in the observations in schizophrenia and used non-schizophrenic patients as controls. However, since our findings in epilepsy differ from those reported by Hodskins, Guthrie and Naurison,[13] and the subject of water balance is of importance in this disease, it is worth while to record our findings (*v.* Table 4).

Circulating Blood Volume in Involutional Psychosis and Mental Deficiency.

The circulating blood and plasma volume in the patients with involutional psychosis were lower than in the schizophrenic patients. The individual and average values are given in Table 5. We cannot

TABLE 4.

CIRCULATING BLOOD VOLUME, PLASMA VOLUME AND PER CENT RED CELLS IN EPILEPSY.

Subject.	Blood volume, cc. per sq. m. of body surface.	Plasma volume, cc. per sq. m. of body surface.	Red cells, per cent.
N. T.	2359	1229	47.6
A. S.	2467	1349	46.6
M. T.	4478	2331	47.9
L. S.	2539	1282	51.9
E. R.	2222	1200	45.2
I. B.	2360	1247	46.6

TABLE 5.

CIRCULATING BLOOD VOLUME, PLASMA VOLUME AND PER CENT RED CELLS IN INVOLUTIONAL PSYCHOSIS.

Subject.	Blood volume, cc. per sq. m. of body surface.	Plasma volume, cc. per sq. m. of body surface.	Red cells, per cent.
H. L.	2357	1250	46.6
M. V.	3024	1518	49.3
B. H.	1881	1056	44.0
A. M.	2395	1305	44.0
S. H.	2364	1326	44.0
M. S.	2253	1307	42.6
E. H.	2322	1301	43.4

explain the finding of a low circulating blood volume in involutional psychosis, it may be chance, because only seven patients were examined, but it is of interest to note that the values are remarkably similar in each patient.

The findings in the seven patients with mental deficiency showed a great variation, the blood volume varying from 2038 cc. per square meter of body surface to 3261 cc. The plasma volume showed a similar range—from 1183 cc. to 1931 cc. The average values were: blood volume per square meter body surface, 2687 cc.; plasma volume, 1508 cc.; red cells, 45.9 per cent.

The four remaining subjects included 2 with paranoid state, 1 with psychopathic personality and 1 with senile dementia. The results are given in Table 7.

TABLE 6.

CIRCULATING BLOOD VOLUME, PLASMA VOLUME AND PER CENT RED CELLS IN MENTAL DEFICIENCY.

Subject.	Blood volume, cc. per sq. m. of body surface.	Plasma volume, cc. per sq. m. of body surface.	Red cells, per cent.
A. M.	3214	1931	46.2
M. S.	3261	1826	
L. H.	2602	1379	46.5
F. C.	2512	1383	45.2
A. E.	2329	1342	
N. D.	2854	1514	46.6
C. S.	2038	1183	45.0

TABLE 7.

CIRCULATING BLOOD VOLUME, PLASMA VOLUME AND PER CENT RED CELLS IN PATIENTS WITH VARIOUS MENTAL DISORDERS.

Subject.	Blood volume, cc. per sq. m. of body surface.	Plasma volume, cc. per sq. m. of body surface.	Red cells, per cent.
K. C. Psychopathis personality	2714	1440	46.8
E. B. Senile dementia	1918	1000	47.2
R. D. Paranoid state	2160	1292	43.8
A. B. Paranoid state	2052	1109	45.2

SUMMARY AND CONCLUSIONS.

The circulating blood volume was estimated with the dye method in 39 patients with schizophrenia, 15 with manic-depressive psychosis, 6 with epilepsy, 7 with involutional psychosis, 7 with mental deficiency, 2 with paranoid state, 1 with senile dementia, and one patient with psychopathic personality.

An estimation of the circulating blood volume in schizophrenia is part of a systematic program of determining the water balance, capillary permeability, reactions to the posterior pituitary antidiuretic hormone, heat regulation and oxygen consumption rate in this disorder. We find a low circulating blood volume in patients with dementia præcox as compared with manic-depressive patients whose circulating blood volume approaches normal values. The schizophrenic patients had a blood volume per square meter of body surface of 2609 cc. as compared with 2973 cc. in manic-depressive

patients. The plasma volume in dementia præcox per square meter of body surface was 1433 cc. as compared with 1727 cc. in the manic-depressive patients. The blood volume per kilogram body weight in schizophrenic patients was 78.9 cc. and the plasma volume 43.3 cc. as compared with 87.9 cc. and 50.9 cc. respectively in manic-depressive psychosis. The per cent red cells was 45.2 in schizophrenia and 43.5 in manic-depressive psychosis. The definite diminution in the circulating blood volume in dementia præcox seems to be related to disturbances in water metabolism, capillary permeability and vasomotor tonus, secretion of the antidiuretic and vasopressor hormone of the posterior pituitary gland, basal oxygen consumption rate and indirectly heat regulation. These physiological

TABLE 8.

No. of cases.		Blood volume, 100 cc. per sq. meter of body surface.			Plasma volume, 100 cc. per sq. meter of body surface.		
		Min.	Max.	Av.	Min.	Max.	Av.
39	Schizophrenia	19	33	26	10	21	14
15	Manic-depressive	21	37	30	11	22	17
91	Normal (other authors)..			31+			18—
6	Epilepsy	22	44		12	23	
7	Involutional psychosis ...	18	30		10	15	
7	Mental deficiency	20	32		11	19	
4	Miscellaneous	19	27		10	14	
24	Average of last 4 groups..			25			14

processes are partly regulated by hypothalamic centers. The hypothalamus is also a region of the brain concerned with emotional expression. Thus physical variations in schizophrenia, of which the diminution of the circulating blood volume is an example, may be due to a dysfunction of the hypothalamus.

The average circulating blood volume in six patients with epilepsy was low.

The circulating blood volume in involutional psychosis was lower than in schizophrenia. The values were similar in all patients.

There was a great variation in blood volume in the patients with mental deficiency, but the average was lower than normal.

When the various patients, other than those with manic-depress-psychosis, such as patients with epilepsy, involutional psychosis, mental-deficiency, paranoid, senile dementia and psychopathic per-

sonality are averaged as a total control group, 24 in number, their average blood volume and plasma volume per square meter of body surface is found to be practically identical with that of the schizophrenic group, if anything a little lower. (*v.* Table 8).

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DISCUSSION.

DR. WALTER L. BRUETSCH (Indianapolis, Ind.).—I want to ask Doctor Finkelman whether the low plasma volume is not due to the small size of the vascular system in dementia præcox. The workers at St. Elizabeth's Hospital have found a hypoplasia of the heart and vessels in dementia præcox patients. For several years we have made an effort to check up on these statements. It is true that in a great number of schizophrenic patients, although not in all, the size of the vascular system is unusually small.

DR. FINKELMAN (Chicago, Ill.).—In answer to Dr. Bruetsch's question, in the paper, I have discussed Dr. Nolan Lewis' work, in which he showed that dementia præcox is characterized by a small caliber of the aorta and small heart and a very inadequate, infantile undeveloped circulatory apparatus. Perhaps the low blood volume is related to that constitutional defect. But discussion along this line is very difficult. In dementia præcox we find there is a slow circulating blood volume. We may conclude it is due to a defective circulatory apparatus which is found frequently in patients with schizophrenia, or the whole picture, low circulating blood volume, small circulatory apparatus, and the other physical findings in dementia præcox, such as cyanosis of the extremities, salivation, etc., is due to some central nervous system defect.

Certainly the mental symptoms in dementia præcox are not related to their circulatory apparatus. There should be a tendency to look for an explanation in the brain, which, after all, is the organ of adaptation to the environment; the brain (and perhaps the endocrine glands), is after all, the organ which many people think is responsible for their delusional expressions. They do not have delusions because they have a small circulatory system. There are many normal people with infantile circulatory systems. That is perhaps a bias on my part, to look for an explanation in the central nervous system.

BRAIN POTENTIALS FROM NORMAL SUBJECTS, STUTTERERS AND SCHIZOPHRENIC PATIENTS.*

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Psychopathic Hospital, Iowa City, Iowa.

The primary purpose of our study was to find out if, in the activity represented by the cortical potentials called the "Berger" rhythm (electroencephalogram), consistent differences could be demonstrated in stutterers and schizophrenics as compared with normal subjects.

In addition to this we wished to investigate the justifiability of the distinct classification of the waves into two types.

Berger [1] states that the distributions of frequency and amplitude of the potential waves are bimodal. One mode is formed by waves having a frequency of 10 per sec. and an amplitude of 20 to 60 microvolts (alpha waves). The other mode is formed by waves having a frequency of about 25 per sec. and an amplitude of 10 to 15 microvolts (beta waves). Other workers, notably Gibbs, Davis and Lennox [2] report Berger's classification unsatisfactory since they find a continuous range of frequencies and amplitudes rather than two discrete classes.

Before any definite conclusions may be drawn from electroencephalographic studies of abnormal subjects, an adequate sampling of normal subjects will need to be carefully evaluated. From a total of 75 adult normal subjects we made a detailed analysis of the brain potential waves of 19 of them during both silence and speech. Compared with these results were those obtained from 17 adult stutterers during silence, non-stuttering speech, and stuttering and 9 adult schizophrenic patients during silence.

Procedure.

The apparatus has been described in a previous communication.[3] Fine platinum rhodium needles were used for leading off the brain potentials. Except for the very tips they were baked in bakelite varnish for the purpose of insulation. One needle was inserted

* Read at the ninety-second annual meeting of The American Psychiatric Association, St. Louis, Mo., May 4-8, 1936.

through the scalp to the periosteum over the left occipital area, and the other approximately over the left motor area, each needle about 2.0 cm. from the midline. The subject reclined with the eyes closed in a dark semi-soundproof and shielded room. In the case of the normal and stuttering subjects, records were taken during silence and simple propositional speech. The voice was recorded photographically on the brain potential film. Stuttering spasms were signalled by the experimenter as he heard them through the voice recording circuit. The records were evaluated in the following manner: the duration of a potential wave was measured from trough to trough in hundreds of a sec.; the amplitude from trough to peak in microvolts. For all subjects under all conditions a total of 4061 waves were studied for frequency and amplitude.

The reliability of the worker * making the measurements was determined by remeasuring 100 waves selected at random. The per cent agreement between the two readings was 95 per cent for duration and 89 per cent for amplitude.

Results.

For all subjects under all conditions the frequency range was from 3 to 50 waves per sec., and the amplitude range from 2 to 122 microvolts. All distribution curves supported the concept of a continuous series of frequencies and amplitudes rather than the concept of two discrete classes as implied in the writings of Berger. The mean frequency for all subjects under all conditions ranged from 10 to 11 waves per sec. Although the following differences were small, approximately one wave per sec., they are statistically significant: the waves during non-stuttering speech of stutterers were slower than those for speech of normal speakers; and those during non-stuttering speech of stutterers were slower than those during stuttering. It is noteworthy that there were no significant differences in the frequency of the waves for speech of normals and those for stuttering speech of stutterers.

The mean amplitude for all subjects under all conditions ranged from 21.87 to 27.14 microvolts. The following differences were

* We are indebted to Mr. John R. Knott for the exacting task of evaluating the records.

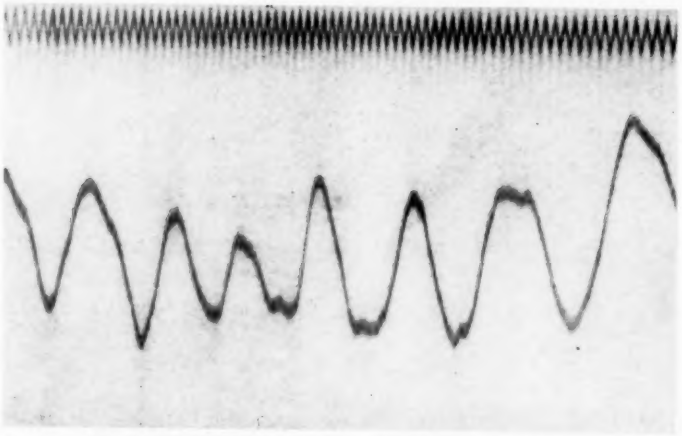

FIG. 1.—Electroencephalogram from normal subject during silence. In this and in subsequent records time (at top) in 1/100 sec.

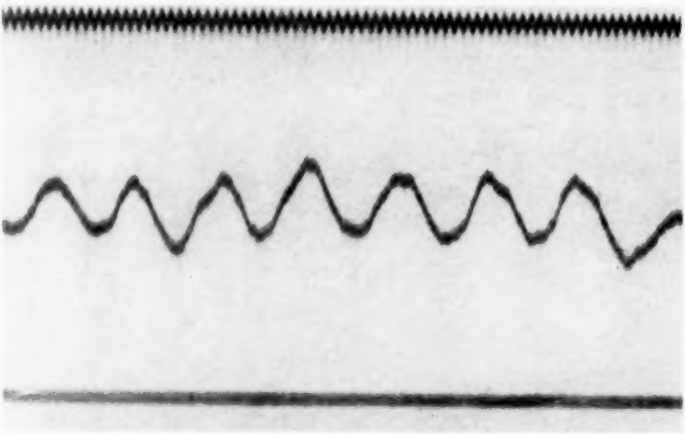

FIG. 2.—Electroencephalogram from schizophrenic patient during silence.

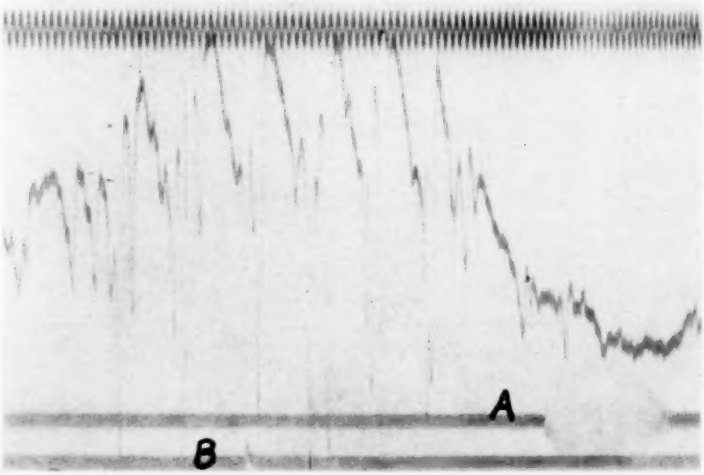

FIG. 3.—Electroencephalogram from stutterer during tonic spasm showing large spiked potentials. Voice A and signal line B at bottom. Record typical in showing no voice during discharges and disappearance of discharges just before voice came in.

statistically significant: the waves during the stuttering speech of stutterers had greater amplitude than during speech of normals and non-stuttering speech of stutterers; and the waves during non-stuttering speech of stutterers were larger than those during speech of normals.

Two stutterers deserve individual consideration. They showed marked changes in brain potential activity during a large number of complete tonic (prolonged stuttering) spasms in which there was no voice. During these spasms there appeared large peaked spikes with an average amplitude of 137 microvolts. At times these spikes occurred quite regularly at a rate of 10 per sec., while at other times they occured at as high a rate as 33 per sec. The mean frequency was 17 per sec. These discharges never appeared during a clonic (repetitive) block and rarely during a tonic block with voice. In all instances the potential waves followed the moment of initiation of the stuttering spasm as determined on the voice line. Voice never reappeared until the discharges had ceased. In an attempt to ascertain the origin of these large spiked potentials, we placed both electrodes over what we presumed to be the left motor area. During silence the regular "Berger" rhythm was reduced 64 per cent, while during tonic spasms the large spiked potentials were reduced only 16 per cent in amplitude. Since in the recording from the motor area the waves of the "Berger" rhythm were reduced significantly more than the spiked potentials, we may tentatively assume that the latter arise from the motor cortex. A series of control experiments in which we had the stutterer simulate as nearly as possible the physical characteristics of the voiceless tonic spasms convinced us that the large discharges were not related to the motor activities incident to, or symptomatic of the spasms insofar as those activities and symptoms can be voluntarily reproduced by the stutterer.

Schizophrenics and normal subjects did not differ significantly in in regard to either the frequency or the amplitude of the brain potentials during silence.

Discussion.

We feel we have enough evidence to say quite definitely that in regard to both frequency and amplitude the potentials from the

human brain present a continuous series. Under certain conditions there may be two or more discrete classes of waves such as the alpha and beta waves of Berger, but the evidence does not point toward such a bimodality for the conditions we have studied. A discussion of the differences between stutterers and normal speakers that we have found is difficult since these differences, although statistically significant, were small and since the trends were often in the same direction between silence and speech for both normal speakers and stutterers. However, it may be important that the waves during the stutterers speech were slower than those during the normal speakers speech. Further, it may be important that the waves during stuttering were larger than those during the speech of normals and the non-stuttering speech of stutterers, and that the waves during the non-stuttering speech of stutterers were larger than those during the speech of normals. If slower and larger waves are, as Gibbs, Davis and Lennox report, indicative of a mental state of impaired consciousness then during stuttering and the normal speech of stutterers there may be some condition of impaired consciousness. Since our differences were small, the impairment of consciousness must have been correspondingly small. We have no interpretation of the large spiked potentials occurring during tonic blocks in two stutterers. Apparently they indicate some striking disturbance in the function of the motor cortex.

Because the number of our schizophrenic patients was small, our statements in regard to our negative findings with them cannot be conclusive. At present we can say that, in the light of our method of analysis, no significant and consistent differences between schizophrenics and normal individuals could be demonstrated. Further studies are being carried on to discover whether more material and new methods of analysis may not admit of positive findings.

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DISCUSSION.

DR. GEORGE BISHOP (St. Louis, Mo.).—My experience with these brain waves has been largely with animals. We have worked on rabbits, dogs and cats, chiefly rabbits. I think the chief thing I can say here is that we can confirm Dr. Travis in one respect, that is, we get from animals with exposed cortex in the best possible manner of reading we can devise, action currents similar to his on the outside of the brain, all the way from zero amplitude to over a millivolt, from frequencies of 3 to 6 per second and with all fluctuations, large and small, which he reports over the whole range of his normal cases and other cases. In other words, in rabbits which we can't diagnose for pathology, we find as complete a range as you can possibly measure. It doesn't seem possible that either the amplitude or the frequency of these brain waves can be an adequate diagnostic index of mental activity. That doesn't apply, however, to such things as the form of the wave.

The particular interest here for me is that Dr. Travis gets in these stuttering cases, where you have an obvious spastic condition, a condition very similar to strychnine convulsions when it is entered on the surface of the cortex or injected into the rabbit. The records reported in epilepsy show an apparently spastic condition of the cortex gives diaphasic waves. These have two spikes, one down and one up. That is quite characteristic, a sharp diaphasic wave characteristic of spasm of the cortex.

These experimental studies on animals we have been making have been directed largely toward analyzing these normal waves of animals, and particularly with analyzing the response to stimulation. In rabbits, the frequency is 5 per second instead of 10, otherwise the similarity is quite close.

If the optic nerves of these animals are stimulated with single induction shocks, we get a 5 per second response, even though the 5 per second rhythm is not present in the first place. There is a close correlation all the way through with the response to stimulation with a normal afferent activity of the optic tract and with the activity spontaneous of the optic cortex. It looks as if the two things were involved together; the normal activity, that is, the spontaneous activity of the brain without vision and the induced activity vision are somehow similar and have the same frequency.

The other factor I wish to mention is that these waves are apparently involved with the thalamus or the thalamus is involved with them. That is, if one cuts the optic radiation without other injury to the cortex, the spontaneous activity stops as well as the afferent activity, again indicating the correlation of the two.

The records which Dr. Travis has presented, as I say, are quite comparable to what we call normal rabbit records, normal animal records. The variation in the spontaneous response of animals is so very great that we have simply given up in our laboratory trying to analyze them, trying to make any sense out of them at all. As I say, they vary over the maximum range we can imagine, from nothing to everything, and from frequencies of—well, if we counted the frequency he does, we would get up to the same range he does, up to 25 a second or so. These main waves break up in peculiar ways. Apparently

the causation of these waves is a synchronization of a lot of cortical elements. If you happen to have all the elements of the cortex or many of them going off at the same rate and the same time, you will get an additional summation of these effects to give large waves. If they happen to be going off at different times out of harmony with each other, you get small waves or none. We think the only difference between our records of high amplitude and of low amplitude is that in one case the elements of the cortex happen to be going over in synchronism and in other cases they are asynchronized. They are all rhythmic and presumably the cortex is active, when you see nothing, that is, when you see the maximum waves. The amplitude or the frequency is probably no index whatever of the spontaneous activity of cortex. It is obviously an index of the cortex to respond to light stimuli, for instance. The rhythm present or absent does not tell whether a person can see in any respect. If you flash a light, he sees it, whether or not he has it, and, therefore, it is not an activity of the cortex; the activity is present but the brain wave does not indicate of how much the activity is.

For those reasons it seems to me that Dr. Travis is right in believing that the variations he might find there between pathological cases and normal cases should not be considered significant—the various amplitudes or rates. I am much interested in these various results he gets in stuttering.

MEYER K. AMDUR, M. D. (Augusta, Ga.).—With all my respect for Dr. Berger, I would like to state that attempts to study and trace the bio-electric manifestations of the nervous system were undertaken several decades before Berger. Already in 1849, Rubois-Raymond had ascertained the fact that the brain, as well as the nerves and muscles, of rabbits, frogs and other animals, possess electro geneous qualities. The Russian physiologist Setczenov, in 1874, made public his observations on action currents in the medulla oblongata of frogs. In 1875, Caton had found in his studies of the currents in the cortex of brain hemispheres, that the active part of the brain is electro-negative, and therefore its state of excitement is accompanied by negative oscillations. He also ascertained that the electrical potentials of the cortex are changed by stimulation of sensory nerves or sense organs. Danilevsky, in 1876, discovered that stimulations of the sensory nerves of the skin produce noticeable currents in the frontal parts of the brain cortex, while in the occipital parts, currents were provoked mainly by sound stimulations of the auditory organs. In 1888, Gotch and Horsley, too, studied the bio-electric manifestations of the peripheral and central nervous system. Vvedensky, in 1889, made use of the telephone for electro-physiological studies of action currents, in nerves and muscles. In 1890, Fleischel von Marxov obtained currents from the visional area by exposing the eye to light. In 1900, Trivus dedicated his dissertation to the same problem. Kaufman, in 1912, worked extensively on this same subject, and he concludes his excellent paper with the following interesting statement:

"One can only wonder why further studies of bio-electric currents of the nervous system were neglected over two decades." In 1925, Prawdicz-Neminski resumed work along the same lines, using the string galvanometer.

As one can see, from these few references, there is "nothing new under the sun." One would like to hope that this work that is being carried on at present in many institutions all over the world will throw new light on many problems in psychopathology.

DR. WILLIAM MALAMUD (Iowa City, Iowa).—I should like to add a few remarks to the presentation by Dr. Travis emphasizing particularly the fact that if Dr. Travis appeared rather cautious in his remarks it was purposely so. It is a well-known fact that ever since Adrian's investigations have shown the importance of Berger's method, a tremendous amount of interest has been shown in this field, interest that probably has a little more enthusiasm than carefulness and reliability in it. The so-called "brain waves" have been linked up with all types of mysterious notions up or down to mind-reading and mental telepathy. A large number of statements were made which were not at all justified and we are anxious to correct this.

At the Psychopathic Hospital in Iowa, we are trying to find what reliable evidence there may be of a parallelism existing between neurophysiological and psychological concepts, and this is exactly what we wish to emphasize in the present report. We should not like to see this particular approach, however, get into exactly the same disrepute as, for instance, chronaxia did a few years ago. Chronaxy, which, I think, is still a promising angle of approach, has been practically thrown out of some of the scientific laboratories in this country simply because certain statements were made which are not supported by fact; and because these statements could not be proved, the whole field was thought to be unreliable.

It is because of this that we presented the paper today, and not because of any claim of specific relationships. It is a good lead, but we must be very careful in following it up.

DR. CLARENCE O. CHENEY (New York, N. Y.).—I may say my associates at the Institute have been working for the last two or three years on these phenomena and we have not yet felt that we were in a position to bring forth any conclusions or to publish any material because we are still quite uncertain what all this means.

The electrical-physical technicalities in these phenomena are very complicated ones, as we see it. Dr. Forbes has worked particularly on the control of electrical potentials. There has been a brief contribution made by him on the physical side, but we are not prepared and do not expect for some time to be able to draw any final conclusions.

DR. LEE EDWARD TRAVIS (Iowa City, Iowa).—I should like to make four statements with regard to what has been said. In the first place, I believe that Dr. Bishop went a little too far in saying that these waves need not be related to or indicative of any psychobiological condition of the organism, because you can put the subject in a very easy relaxed condition, the waves becoming well defined; you can say something to him or give him a pure tone or flash a light in his eyes and they go down, showing they have been dis-

turbed, and they do that sufficiently consistently that you can get latencies and you can do other things to the subject like, for instance, instead of having these things occur to him and he know nothing about it, you can have him respond by very simple response and he can change that latency and change the frequency of the wave following that latency. We have found that in our research.

Another statement I should like to make is that undoubtedly Berger didn't discover electrical impulses from the brain, but, in all fairness to Berger, I suspect if Berger had known all that had been done before and had thought out very carefully, he would not even have thought of doing what he did, because I witness the fact that people were so loath to pick up this work after he actually demonstrated that such impulses did come from the brain. They thought it must come from some other place, the muscles of the scalp or muscles of some other part of the body or some other place. In other words, the whole thing was frowned upon. Adrian was extremely skeptical when he undertook checking things; as Dr. Malamud said, the checking was delayed over a long number of years merely because they thought it was a very bum steer.

Something simply to mull over is that Loomis and Gibbs, Davis and Lennox have reported that in general, larger, slower waves are expressive of or related to in some way impaired states of consciousness. Now if these small but apparently significant differences that we reported in stutterers mean anything physiologically, that is, during the spasm the waves are larger and slower, then it may be that during a spasm there is some state of impaired consciousness. I want to mention that as a possibility.

AUTOMATIC CONTROL OF CONTINUOUS BATH.*

By WALTER E. LANG, M. D.,
Superintendent Westborough State Hospital, Westborough, Mass.

Although there are a number of references to prolonged baths in the literature of the latter part of the last century, attention was not focused on this method of treatment until about 40 years ago, when Kraepelin used and advocated it in his clinic. Whereas, prior to his time, such baths had been "protracted for an hour or two," Kraepelin was a pioneer in the real continuous bath, as he extended the period of treatment from hours to days, weeks or even months. In the treatment of mental diseases, this therapeutic measure is too well known and widely used to make needful the discussion of its merits in this paper. Its employment, however, has been attended by hazard, and many have been the casualties resulting from its use. The consequences of these unfortunate accidents have been distressing, both to the families of the victims and to the administrative officers responsible for the institutions in which they occurred. Such incidents have tended to discredit this treatment in the eyes of the public, and that it has survived and its use been extended clearly testifies to its real therapeutic value.

From the beginning it was generally recognized that to obtain the best results the temperature of the bath should be at or slightly below that of the body, and that it be maintained with as little fluctuation as possible. For many years the temperature of the water in the tub was regulated manually, by the introduction of small quantities of hot or cold water at intervals, following the use of the bath thermometer. Later came thermostatic mixing valves, which supposedly delivered water at a fixed temperature. Some of these mixed hot and cold water, and others water and steam. The latter were particularly lethal, in that upon any failure of the water supply, steam came through without warning. The first-mentioned, however, carefully checked by the hand bath thermometer, served

* Read at the ninety-second annual meeting of The American Psychiatric Association, St. Louis, Mo., May 4-8, 1936.

for many years. However when a single thermostatic unit went awry at a moment of human inattentiveness serious trouble developed. A little scale or other deposit in the supply line, with a drowsy attendant, and the stage was set for trouble. Recording devices with automatic alarms were a step forward. Such systems generally consisted of mixing hot and cold water in a thermostatic valve and recording the temperature of the mixed water prior to its delivery to the tub. This type of equipment required the use of excessively large quantities of water, and the temperatures of the water supplied and the resulting mixture in the tub were many degrees apart. In order to be economical in the use of water the practice grew up in many institutions of making the flow intermittent and, as provision was made for an audible alarm if the temperature varied two degrees, the alarm bells sounded with such annoying frequency that they were often switched off, leaving this type of installation when thus used, of no greater safety value than the ordinary thermostatic mixing valve that had preceded it.

In the spring of 1932, when about to make an installation of a new six-tub continuous bath unit at the Westborough State Hospital, it was decided to experiment and, if possible, to produce an apparatus that would accomplish the following:

(a) Automatically maintain, at a predetermined temperature, the water actually in contact with the patient's body.
(b) Make a permanent record of that temperature.
(c) Provide additional means for protecting the patient from high temperatures due to mechanical failure or human carelessness.
(d) Conserve water.

The period of experimentation continued for more than six months. Recording controllers of several different makes were tried, as were valves designed to operate with them. Some of these latter were motor-controlled and others were actuated by compressed air. Our observations soon proved to our satisfaction that the air-controlled, diaphragm valve not only required the use of less water, but was an important additional safety device, as it opened against the resistance of a strong coiled spring, which promptly closed it in the event of any failure of air pressure. This type of valve also assured a more even flow, as its opening was graduated according to the demand upon it, instead of its being fully opened or tightly closed, as in the case of the motor-controlled valve. A

further advantage was that the reserve air pressure would operate it for two hours in case of interruption of electric current supply. As the tub itself was to become the mixing chamber, it appeared that it would be necessary to have the controlling thermometer bulb in the tub, which was obviously impracticable, or to find means of recording the temperature of the water as it left the tub. The water leaving the tub by the surface overflow was of lower temperature than that of the center of the body of water, and its flow was intermittent. It was felt that an auxiliary overflow, through which there could be maintained a constant circulation from the mid-level of the tub, would accomplish the desired end. An opening was provided, therefore, in the foot end of the tub, midway between the bottom and the surface overflow, and to this opening was attached, external to the tub, a vertical chamber containing the controlling thermometer bulb, and having from its upper end a quarter-inch overflow pipe extending to the common overflow and discharging into it at a point one inch below the surface of the water in the tub. By this means, it was found that a constant flow of water from the tub, over the thermometer bulb, gave a temperature tracing parallel with, but two or three degrees below, that in the center of the tub. Upon heavily insulating the bulb chamber, the temperature recorded therein was the same as that in the tub itself. A capillary tube from the bulb chamber extended to the controlling recorder, which not only recorded the temperature, but also regulated the air pressure to the diaphragm valve and permitted sufficient water, at a few degrees higher than that in the tub, to enter if the temperature fell below that for which it was set and diminished or stopped the flow when the prescribed temperature was again attained. The controlling recorder also made an electrical contact which illuminated a red signal and sounded a bell if the temperature advanced two degrees, and caused the illumination of a green signal in case the temperature declined two degrees below the predetermined level. The water supply came from an automatically-regulated storage tank in the basement, at 140 degrees. At the back of the panel board this was mixed with cold water in a thermostatic mixing valve to a temperature of 108 degrees, and through the air-actuated diaphragm valve this water was admitted to the tub in just sufficient quantity to maintain the tub

water at the predetermined temperature. As water at a higher temperature and in greater volume was required for cleaning and filling the tub, a separate thermostatic valve manually controlled, furnishing water up to 120 degrees, was provided. These two supplies were brought to a three-way valve, which according to its position would admit one or the other to the tub.

It will be seen that the safety features were multiple. The first-line defense was the automatic regulation of the storage water at 140 degrees, the second-line the thermostatic mixing valve which reduced its temperature to 108 degrees, the third-line the air-actuated diaphragm valve which admitted the water to the tub, the fourth-line the red signal and audible alarm, and the fifth the hand bath thermometer. As two of these devices were thermostatic, one air pressure, the fourth electrical and the fifth a thermometer, the probability of all developing mechanical trouble at one time was too remote for consideration. If only one of the five were operating properly, no serious situation could develop.

A unit of six tubes, with controllers and valves gathered together on one panel board has now been in operation 24 hours a day for over three years, and on no occasion under automatic control, has it registered a temperature two degrees higher than the level for which it was set.

Tests to determine the amount of water used have been made from time to time. The waste line in the basement has been opened, the total flow collected for three hours, and then weighed. The average amount used per tub was 20 gallons per hour. This is a decided contrast to the 150 gallons required by previous installations. Water heated to 108 degress costs at our hospital $.239 per thousand gallons. The saving in a year, with continuous use, is $271.93 per tub. The safety features have value beyond reckoning.

In order that the record made by the controlling recorder may be beyond dispute, it is the practice at Westborough to have a member of the engineering force change the charts at 7 a. m., the recorder boxes being securely locked during the ensuing 24 hours, and the keys retained by him. The engineer also inspects the storage tank regulator and the air compressor on his way to the tub room, where with the dial thermometer he checks the temperature of the water in the tubs with that shown on the controller charts,

after changing them. He also synchronizes a time clock on the nurse's desk with the clocks of the controllers. The time clock stamp is used for stamping the patient's bath record at the time he enters the tub and again when he leaves it, thus making a record whereby may be shown conclusively the exact temperature of the water for the entire period any individual patient is under treatment. I am informed that such a record would be accepted as evidence in any court.

Although the description may cause it to appear that the operation of this equipment is difficult, such is not the case. Nurses or attendants of average intelligence learn its use readily. There are but six directions:

1. Close waste valve from tub.
2. Set three-way valve at "Fill."
3. Open filling valve until its thermometer reads 96 degrees.
4. When tub is full, turn three-way valve to "Automatic."
5. Check with temperature shown on recorder chart, and the tub is ready for use.
6. After placing patient in tub, stamp the bath record in the time clock.

It has required not a little courage to present to this association a paper dealing primarily with mechanical devices. The justification is that lives may be saved.

DISCUSSION.

Dr. Henry I. Klopp (Allentown, Pa.).—It gives me pleasure to open the discussion of this subject. Having personally been connected with the Westboro State Hospital for seventeen years, and having obtained my initial experience in the use of the continuous flowing neutral baths at that institution, it is gratifying to have personally observed the development of this new system.

I can vouch for the statements made by Dr. Lang; the quick response in the change of temperature by adding cold water. Immediately there is a drop on the chart, and promptly, it returns to normal temperature.

I wish that all our institutions could be protected by the use of this automatic control. It is my opinion that there is no system in the United States or Canada which equals it. I make this statement advisedly.

At Allentown, we have thirty-seven specially designed tubs, minus the automatic feature. They are controlled, however, by the Leonard-Rooke thermostatic valve, and furthermore, our hot water system is supplied from a central point, and the temperature there is not permitted to get above 140 degrees Fahrenheit, so that by the time it reaches its destination, there is some drop.

Another factor brought out by Dr. Lang is that in Pennsylvania, we had a sad experience at one of our county institutions for mental diseases in which there were two patients scalded through defective hot water apparatus. That institution has since installed this system. You can readily appreciate what it means to a superintendent, and to the relatives of patients, to know that such a thing is not likely to happen.

Where there is automatic control as stated by Dr. Lang, there has been no casualty of any kind. My first experience in casualty was in Westborough, when we first started to use continuous baths according to the Kraepelin method used at the Psychiatric Clinic in Munich, which I had the pleasure of visiting and observing.

The main thing is that the feature of safety is of vital importance. Were it not for the initial cost, it certainly would be worthwhile to have same adopted, in each institution, in fact, should be compelled to do so, if they operate continuous flowing neutral baths.

The initial cost is offset by the economy as brought out by Dr. Lang, in the use of water and heat units. Efficiency is vital, and this gives the actual record. Above all, the prevention of scalding of patients. Some of us have been fortunate and I can only attribute it to the carefulness of the nurses and the use of hand thermometers in addi to thermostatic control.

If state central organizations would impress legislators with the importance of this safety, I think we could get it across to obtain special appropriations for the installation of this system in hospitals for mental diseases.

Dr. Walter E. Lang (Westborough, Mass.).—I have no particular thought except to supplement Dr. Klopp's statement that "In three years of use there have been no casualties." In three years of use, there have been no departures of two degrees from the pre-determined level, and of course no casualties of any kind.

A STUDY OF ALCOHOLISM IN WOMEN.*

By JAMES H. WALL, M. D.
Bloomingdale Hospital, White Plains, N. Y.

This paper is the second part of a study of alcoholism at Bloomingdale Hospital. The first, *A Study of Alcoholism in Men* was a consideration of 100 men who were patients in the hospital at different times between 1920 and 1933, a period of 14 years. They represented the total consecutive admissions of cases in which the immediate cause of hospitalization was alcoholic indulgence. The present study is concerned with the women patients, 50 in number, who were admitted during the same period. The diagnoses were as follows:

Diagnosis.	No. of patients.
Alcoholism without psychosis	13
Psychopathic personality with alcoholism	8
Delirium tremens	13
Acute hallucinosis	5
Korsakow's psychosis	7
Alcoholic deterioration	4
	50

The family background of these patients was not unusual. One-half of them showed alcoholic individuals in the two preceding generations. There were 12 fathers and only two mothers who drank to excess. In 13 instances there were friction and unhappiness in the home. The parents were incompatible and contributed much toward an unwholesome environment. There was no noticeably exaggerated emotional attitude of either parent toward these patients in childhood. As to their religious faith, 38 were Protestants and 12 were Catholics.

The infantile period of most of these patients was not thoroughly accounted for. In infancy there were no outstanding feeding problems, and as a group the patients were robust, healthy children.

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Of striking interest was the frequent occurrence of temper tantrums. In 32 of the patients it was definitely established that during infancy and early childhood they were given to outbursts of rage, oftentimes elicited by the slightest frustration or denial. This pattern of behavior continued, and in adult life they were inclined to react to difficult life situations by throwing things and displaying a childish tantrum. A state of alcoholic intoxication served as an excuse for such outbursts.

Prior to puberty they were active and energetic; 30 of them were described as tomboyish. They were fond of boys' games and sports, frequently expressing openly their intolerance of the interests of their female associates. Masturbation was a concomitant factor in this type of development. Noticeable was the absence of strong attachment to any member of the family. Those who were near in age to male siblings were envious of them and rivalry was quite keen. In their school work, as a group, they were above the average. The average age for menophania was 13. Dysmenorrhea was present in 40 of these patients, and continued throughout the period of hospitalization. All of these patients were examined by a gynecologist, and at the time of their hospital residence there was no pelvic pathology to which the pain could be attributed. In addition to the symptom of pelvic discomfort, there was an associated premenstrual depression of spirits. They were annoyed by the periodic physiological function and used pet names to express their irritation. Careful psychological investigation revealed deeper motives behind the symptoms and emotional attitudes toward menstruation. The phenomenon was interpreted as an insult or injury to a narcissistic personality. Needless to say, the menstrual period became associated with excessive drinking. In the six patients who began to overindulge before the age of 20 the heaviest drinking occurred at this time.

Further study of the psychosexual development revealed a typical attitude toward members of the same sex. The patients did not get on well with other women; this trait was observed in the hospital and corroborated by informants in 33 of the cases. In many instances they said: "I like men but I despise women." In only five instances was there a history of overt homosexuality. As a group their constitutional configurations were feminine.

The average age at first marriage was 23. Their heterosexual adjustments were far from normal. There were 48 married women, 34 of whom made unfortunate marriages. Many of the patients married men who were alcoholic and psychopathic, or men who were many years older or younger than themselves. Divorce occurred in 20 cases, while fully as many were estranged. Pathological jealousy was a factor in seven cases. Only 23 of the patients had children, and invariably the parental rôle was undertaken poorly. Their attitude toward their children was either one of indifference or neglect. In most instances the children were unwanted, or unhappily planned for as a means of saving a marriage from the rocks. Loose heterosexual activities were noted in 30 of the cases, including the two single women. These affairs lacked permanency and were more in the nature of a gesture, suggesting an overcompensation. Naturally these women derived little satisfaction from homemaking and domestic duties. They were bored and unhappy. There was a restless, aggressive part of their personality without outlet for expression. Although superficially friendly and sociable they were sensitive and unable to unburden their deeper emotional conflicts. Among them were women of considerable accomplishment, including seven musicians, five actresses, and two writers. Only seven of them were college graduates. There was a variety of personality types. Emotional instability was present in 28 of the patients, the usual manifestation being mild depressions associated with excessive drinking. It must be noted that cases of manic-depressive psychosis associated with alcoholic indulgence were omitted from this study. There were 13 with a schizoid type of personality. Among the cases to be presented was a woman with underlying psychoneurosis. The diagnosis of psychopathic personality with alcoholism was made in eight instances, but this does not tell the whole story if we consider the larger number who showed unconventional social and moral standards.

For the entire group, the average age when drinking began was 28. There were six who started before the age of 20, 22 between the ages of 20 and 30, 17 between 30 and 40, and five after 40. The patients who began to drink before the age of 20 used alcohol from the first as an escape from unpleasant feelings and situations. Their excessive drinking did not grow out of the ordinary type

of social indulgence. A definite personal problem such as dysmenorrhea, an abortion, or desertion by a lover marked the beginning. The excessive drinking in those who began in the third or fourth decades of life was preceded by a period of the moderate social type of drinking. In this particular group were factors such as an incompatible marriage, guilt and conflict over an extramarital affair, jealousy, childbirth, physical disease, and deaths of relatives. The five patients who began to drink after 40 were passing through the menopause. Insomnia, restlessness and unpleasant physical sensations were given as the causes for inebriety. The fear of growing old was disturbing to those in the climacterium, and one of these patients became profoundly intoxicated for the first time when she was becoming accustomed to dental plates.

The woman alcoholic apparently does a thorough job of drinking. It is always difficult to determine the amount, as after admission to the hospital so many of the patients minimize their drinking. One hears such answers as: "Only a rare glass of sherry wine." Usually the average amount for 24 hours is over one quart of whisky. The alcohol, *per se*, is only one of the factors in bringing about the great physical depletion seen in women patients with alcoholism. For many days the patients with organic mental reactions had gone without food or sufficient amounts of fluids. Rest and sleep were inadequate, and foci of infection were neglected. The rôle of dietary deficiency in the neuropathological complications of alcoholism has been stressed by many writers. On admission these patients were undernourished and physically exhausted; particularly was this true in patients with delirium tremens (13) and Korsakow's psychosis (7). All of the patients showed an initial leucocytosis and a concentration of urine. A discussion of the neurological findings is beyond the scope of this paper.

The mental reactions can best be illustrated by the presentation of representative cases selected from this series.

The first patient, a divorced woman of 28 came to the hospital after seven years of heavy drinking. Her father, a dynamic, successful man, disliked social drinking, but indulged in frequent sprees. The patient was an only child. Physically she was robust and healthy, and as a child was bright, vivacious, and somewhat of a "show-off." Her menses were established at 11, the periods being regular but accompanied by pain and discomfort. She was fond of members of the opposite sex, and her beauty was often praised in her presence. About the age of 10, she showed a great interest in the

preparation and cooking of food. This culinary interest waned as she grew older. She did not enjoy school, and at the age of 16 her formal education ended. For the next few years she led an aimless life of travel and entertaining. She was married at the age of 20, after a short courtship, to a man 10 years her senior. Within a year her first and only child, a boy, was born. She showed little interest in the child, and was bored and irritated by the other young mothers who were naturally her companions. The social and domestic duties incumbent upon her position were burdensome and gave her no satisfaction. Drinking commenced. After two years of marriage she was divorced, and for the next six years she continued her drinking. Her father had some influence over her, and he finally persuaded her to come to the hospital for treatment. For one who had averaged over a quart of whisky per day, she was in excellent physical condition. In the hospital environment she was very happy and comfortable. There were short periods of irritability associated with her menses. She entered upon a serious study of her problems, discussing freely her deep attachment to her father, her dissatisfaction with marriage, and her unproductive life. Her drinking was an escape from an inner feeling of futility. There was a positive side to her personality. She was fond of acting, and took part in many of the hospital entertainments. In the occupational therapy department she was interested in domestic science and for many months specialized in cooking. She left the hospital after a residence of 14 months. She has since become associated with a catering establishment, enjoys her work, and has not been drinking.

The second patient, a married woman of 36, had consumed over a quart of gin per day for two years, and for two weeks prior to admission she was troubled by imaginary voices which accused her of being a rat and threatened to injure her eyes. The family background was normal. She was the oldest of nine children. Her birth and early development were uneventful. She did well in school. Menophania occurred at 15, and up to and through the period of her hospital residence she suffered from dysmenorrhea. Her formal education was completed at 17, and immediately thereafter she met an alcoholic man 20 years her senior. For three years he showered her with every attention and luxury, and at the age of 20 they were married. Neither she nor her husband wanted children, and she often remarked that her beautiful figure was not to be spoiled like those of her married acquaintances who had children. Being beautiful she was popular, and two years after her marriage she began a career of extramarital affairs which caused her much worry in maintaining secrecy. Drinking began at the same time. She was a haughty, self-centered woman, who stubbornly insisted upon having her own way. When crossed in the slightest degree, she staged a tantrum in which she screamed, broke dishes and furniture, and assaulted those about her. She starved herself, and took daily purgatives to keep thin. She was sensitive and suspicious. Two weeks before admission she was discovered by the wife of a friend in his room. She was also worried over a dishonest financial transaction in which she was involved. While at dinner she expressed the

belief that her food was poisoned and thought that she was to be kidnapped. She began to scream, and it was necessary to remove her immediately to the psychiatric division of a general hospital. During the two weeks prior to her admission to this hospital she was disturbed by thoughts of being kidnapped and of being injured. She thought that her eyes were to be burned by acid. She heard voices calling her vile names. On admission here her physical condition was good, although she had been somewhat depleted. For the first month she was changeable. At times she was comfortable, but frequently during the day and night she was troubled by voices which accused her and referred to her past sexual activities. She was extremely fearful that the nurses would throw acid into her eyes. At night she thought that she was being chloroformed. During the day she was well oriented. After two months the auditory hallucinations disappeared. She left the hospital after a residence of three months, and soon resumed her drinking.

The third patient, a married woman of 38, presented the problem of a prolonged delirious reaction with neuritis. She came of a line of distinguished professional people. Her birth and early development were normal. In school she was bright and learned easily. Her menses began at 13; they were regular and without complication. In college she was studious, and upon graduating she worked as a secretary for three years. At 24 she was married to a man of her own age, and her life thereafter was easy and free from responsibility. With her husband she drank heavily every evening, and did not arise until about 11 the next morning. At 26 she had an abortion as she "did not want to be bothered with children." There was a marked narrowing of her interests. She was a poor manager and housekeeper and engaged in none of the domestic arts. She disliked women. Sexually she was frigid. For a month before her admission she behaved in an unusual manner, frequently crawling on the floor. She cried easily, tore things, and talked in an incoherent fashion about her clothes and personal property. At night she screamed and appeared apprehensive. She was disoriented at to time, place and person. Her memory was defective, particularly for proper names. She fabricated freely. She complained of pains in her legs and stumbled as she walked. On admission to the hospital she was emaciated. Her blood pressure was 160/90. The liver was enlarged and firm. There were tenderness and exquisite pain to pressure over the nerves of the lower extremities, with atrophy of the leg muscles and swelling of the ankles. She was noisy and resistive. She thought that she was at home, and misidentified those about her. About her past life she said: "In the white language I would say that I am a century of lives that have died. I don't know who I am. I was born in 1838. I came here last year (wrong). I was on a boat last August. I was with seven Jews. Oh! if I could only pull my old memory together." Within a month she gained weight and began to eat and sleep well. She rested frequently, and continued to complain of pain in her legs. She could not concentrate and she carefully avoided questions in order to conceal her memory defect. She thought that she had been in the hospital

only a few days, and missed the date by six weeks. She fabricated frequently and could not distinguish between the hospital and her home. After three months there was an improvement in her memory. The "let-down" in her habits and appearance was noted by her relatives. She was quiet and talked little to those about her. She had insight into her lack of mental keenness. The neuritis subsided, her blood pressure remained high, and the liver enlargement persisted. She left the hospital after a residence of six and a half months. Within a few months she was reported as having gradually returned to beer, wine and whiskey.

The fourth patient, a divorced woman of 35, presented the clinical picture of an acute delirium in an individual who had been drinking excessively for five months. She was the only child of incompatible parents. Her father was a heavy drinker. Her birth and early development were uneventful. She matured at 11; the menstrual periods were accompanied by pain. She completed a private school education at 16, and thereafter enjoyed a leisurely existence until her marriage at 23. Being narcissistic she enjoyed the attentions of courtship, but marital relations were disgusting and painful to her. Immediately after marriage she developed a fear of infection, and also of being left alone. Having independent means she demanded that her husband give up his business and devote his time to her. For 12 years they had no social life. There were no children of the marriage. She divorced her husband in a fit of jealousy and soon afterward met a man who introduced her to various perversions of an oral and exhibitionistic nature. For two years she was happy with him, but his interest waned and he deserted her. Immediately following this, *i. e.*, five months prior to her admission, she began to drink, with the express purpose of "drinking herself to death." She consumed over a quart of whisky per day, ate and slept poorly, and lost over 30 pounds in weight. When she came to the hospital she was undernourished and dehydrated. There was marked tremor of her fingers. Her mental confusion was more severe at night. She was disoriented, apprehensive, and constantly begged for alcohol. She thought that she was to be operated upon, and feared that her external genitalia were to be mutilated. Visual hallucinations were present; negroes mocked her, and she saw the corpse and dismembered body of her divorced husband. After five days her delirium subsided, and soon she entered upon a serious discussion of her problems. As a child she was afraid of her alcoholic father. She frequently witnessed parental intercourse which she interpreted as an act of violence. From the age of six she had masturbated, and had been frequently detected and reprimanded by her mother. Masturbation and defecation became associated in her mind; this was the root of her fear of infection, which persisted with exacerbations up to the time of her hospitalization. Toward the latter part of her hospital residence she became friendly with her ex-husband, and thereupon developed a fear of blindness with a mild conjunctivitis. It was at this time that she discussed her fear of sexual intercourse; she thought that bodily injury resulted. As she came to understand the dynamics of the

upward displacement to her eyes of her fear of genital injury the eye symptoms disappeared. She made a fair recovery, left the hospital after 11 months, remarried her divorced husband and has adjusted well. There has been no return to alcohol.

Discussion.

The first patient is representative of those women who suffer from chronic alcoholism without psychosis. Many of them lacked those positive assets which prove so valuable in the readjustment of the individual. The second patient is typical of those women who had an acute hallucinosis. The alcoholic psychosis was associated closely with life situations in which the social standing was threatened by a disclosure of unconventional behavior. While psychotic, they heard accusing voices, and feared torture and mutilation. The third patient demonstrates the permanent damage found in those with the Korsakow's type of alcoholic psychosis. For weeks they were physically sick and the mental dilapidation was marked. The fourth patient is an example of those who had delirium tremens. Their trends were similar, revealing ideas of torture. They feared danger to their loved ones and experienced visual hallucinations of their lovers, husbands and children being tortured.

Treatment.

What has been said concerning the treatment of alcoholism in men applies also to the women. Proportionately more of the women patients develop psychoses, and in the case of those with delirium tremens and Korsakow's psychosis emphasis is placed upon the therapeutic measures of rest, increased nutrition, fluid intake, and adequate elimination. Prolonged baths and warm wet packs are far more effective than sedative medication in promoting rest and sleep. The response to this type of therapeutic régime is usually very satisfactory.

For this group the average period of time between the onset of drinking and hospitalization was 13 years. The average age on admission was 41. The patients attempted to solve or evade their problems in this unfortunate way over a long period of time. The average duration of hospital treatment was five months, about one-half of the time usually required for recovery in other diagnostic groups at Bloomingdale Hospital.

Soon after admission these patients are able to follow a full schedule of therapeutic physical, occupational and social activities. New interests are created. Many learn to play for the first time; others develop hobbies in occupational therapy. The women are urged to find some sort of work that appeals to them. The psychiatric interviews give the patients an opportunity to unburden. The personality assets are evaluated in the light of future management. The four case histories reported illustrate the complexity as well as the individuality of the problem. The transitional period between hospital and home environment is supervised, and regular visits to a psychiatrist over a period of a year or more are recommended.

Comparisons—Alcoholism in Men and in Women.

During the same period of time 100 men and 50 women patients were admitted to the hospital. The following table shows their diagnostic grouping:

	Men.	Women.
Alcoholism without psychosis	55	13
Psychopathic personality with alcoholism	12	8
Delirium tremens	10	13
Acute hallucinosis	15	5
Korsakow's psychosis	7	7
Alcoholic deterioration	1	4
	100	50

Proportionately there were more cases of delirium tremens and Korsakow's psychosis among the women patients—an observation confirmed by other statistical studies. The men showed more cases of acute hallucinosis. Deterioration was more frequent in the women. Fully twice as many men were diagnosed alcoholism without psychosis.

Alcoholism occurred in the two preceding generations of 71 of the men and only 25 of the women. No unusual parental attachments were revealed in the women in contrast to the strong mother attachment in 37 of the men.

The men showed a variety of oral cravings; they enjoyed eating, were inveterate smokers, and liked to talk and to sing. Temper tantrums in childhood were outstanding in the women. Certain differences were noted in the field of psychosexual development.

Forty-one of the men became sexually promiscuous shortly after puberty. Thirty of the women showed loose heterosexual activity, but this did not occur until after marriage. The men preferred the company of their own sex; the women disliked other women, preferring male society. Fourteen of the men and 20 of the women were divorced.

For the men, the average age to begin drinking was 18 years; for the women, 28 years. The average age on admission for the men was 38 years; for the women, 41 years. Among the men the average duration of the drinking habit previous to admission was 20 years; among the women, 13 years.

Clinically, the study of alcoholism in men presents a composite picture, the common features being the mother attachment, lack of ambition, irresponsibility, early solitary drinking, and a gradual undermining of the personality. In the women the problem is more highly individual, the excessive drinking being more intimately associated with a definite life situation. Both sexes have in common a narcissistic type of personality with increasing inability to adjust to reality and adult responsibility. Alcohol offers an escape to the blissful state of infantile omnipotence.

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DISCUSSION.

DR. BEN KARPMAN (Washington, D. C.).—I think it is well to emphasize that in the instance of both alcoholic men and women we are dealing with individuals who have been neurotic long before they have been alcoholic. Regarding them primarily as neurotics, there is at least some therapeutic hope that something can be done about them.

There is a general impression existing in the minds of many people and fostered primarily by pharmacology that alcohol has but one definite specific effect on the human body. The experience of psychiatrists, however, reveals that alcohol has a large number of different effects, one might say individual effects, and some have even spoken of the "toxic equation." Janet and others have long called attention to the fact that alcohol has one type of effect on normal people but an entirely different effect on abnormal people. On the normal individual it has the effect of intoxicating him by making him stuporous and in general making him lose his normal functioning. On the abnormal individual alcohol has the effect of raising him to normality. During a short time all the functions of the body and particularly the mental functions appear to be accelerated. The effect persists as long as the alcohol is in the body and wears off in proportion as the effect of alcohol wears off. It follows from this that an abnormal individual takes to alcohol in order to bring himself to the level of normality, which is true. It is therefore a matter of clinical observation that preceding the use of alcohol there is always a depression. Recently, I had an opportunity to talk about that before a group of psychiatrists and the question was raised by some whether it is true that the depression precedes the use of alcohol. If it is not true, is it possible to take alcohol for pathological purposes, without the individual being depressed? If the individual doesn't take alcohol because of depression or to escape the depression, what does he take it for?

The question of jealousy among women has not been mentioned. As one knows, alcoholics as a group are very jealous, but now and then one finds an alcoholic who is not jealous. I should like to ask the speakers what they have learned about jealousy in alcoholic women. In the case of the jealous alcoholic, though his jealousy apparently is directed toward the woman, actually it enables him to preoccupy his mind physically with the man. There is thus a homosexual factor. Is that true of alcoholic women? I believe it is, but I should like to have further corroboration.

It has been a disappointment to me that the problem of alcoholic psychotics has been stressed rather than that of the alcoholic neurotics. It seems that the latter present a much greater problem. There are probably ten cases of alcoholic neuroses to one of alcoholic psychosis.

I have personally come to the conclusion there is no such thing as a normal alcoholic. But some of my psychiatrist friends question that, and I should like to ask if there is such a thing as a normal alcoholic.

DR. J. ERNEST FOX (Lexington, Ky.).—I want to ask a question which has barely been touched on. Each year we get an increasing number of drug addicts in our alcoholics, especially the women, and we find they take phenobarbital, barbital, and other barbiturates. I would like to know the experience of other men along this line.

DR. PAUL SCHILDER (New York City).—The alcoholic woman suffers and suffers deeply from a social insufficiency. Both papers stress the important

point that the woman who is not capable to come close to other human beings and is conscious of it may develop into an alcoholic. She is an individual who feels that some special favors should be given to her. She feels that her body is beautiful and that she should not only get her own love but also the love of others. Out of this conflict there arises constant social tension which is relieved through alcohol. This is true for the alcoholic woman as well as the alcoholic man. The patients assure us again and again that when they drink they feel not only more loved by others but can also give more love to them. It is important to study the alcohol hallucinosis since the psychosis expresses so clearly the deprivations and dangers the alcoholic is afraid of. The patient is afraid that she will be cut to pieces and she has the same fear concerning those whom she loves. The psychological examination makes it at least probable in numerous cases that the psycho-sexual relationship between mother and daughter must have been severely disturbed.

One may speak about a homosexual relation between mother and daughter, fraught with particular danger. It is a disturbance in fundamental human relations. The child fears that something might happen to its body, that it might be dismembered and that the organs so important for social relations—the sex organs—might be taken out.

These are patients who feel that they should be loved and appreciated but they feel insecure whether they will ever receive the appreciation they demand, since they lost the appreciation of their mothers in early childhood.

If we understand the fundamental psychological problems of these patients we should be able to give them again a feeling of social security and to help them to a better adaptation.

CHAIRMAN CAMPBELL.—I think the time has come to abbreviate the discussion, but there is one point we should emphasize, that this exposition of female psychology is altogether from the point of view of the male sex. I am sorry that Dr. Hinkle is not here, who might explain that the presentation of female sex psychology by the male sex is not always quite adequate.

DR. GILBERT E. SEAMAN (Winnebago, Wis.).—I do not for a minute question the legitimacy of the conclusions reached or the principles expressed in this paper, but I would point to what I believe to be the fact that similar experiences would not be revealed in large numbers in the average mental hospital throughout the Middlewest.

In dealing with the alcohol question, I think we find that the more important considerations are the economic situation and the domestic situation, aside from the domestic relationship involving the sex relationship or any of the considerations to which reference has been made.

We find that alcoholism, both in men and in women, is often to a very considerable extent a matter of comparative poverty. We note that alcoholism in men, and requiring treatment in a mental hospital, during this period of the depression has increased greatly. Of course that is true throughout the

country; and I think that these considerations will be found to be the important ones in the average mental hospital, and that the considerations that have been brought to the front in this paper do not play such a large rôle.

Dr. James Wall (New York).—I wish to thank the discussors, and in answer to Dr. Karpman's questions, I have emphasized that drinking in women was in many instances associated with depression, particularly at the time of menstruation. Alcoholism is sometimes associated with neurotic reactions, as illustrated by one of the cases presented. Jealousy was not a significant factor in the patients studied. It is difficult to describe a normal alcoholic. Apparently it is a matter of degree. As a rule the social drinker does not necessarily have the craving for the anesthetic effect nor does he care for the solitary type of drinking. As to suicide, I am sure that if one studies the longitudinal history of several alcoholic individuals, one finds that excessive drinking is equivalent to slow suicide. Many of the patients began to take barbiturates along with the alcohol. This is particularly true of those who have been hypochondriacal and complained of insomnia.

THERAPY IN CATATONIA.

The Effects of Combining Caffeine Sodiobenzoate With Sodium Amytal.*

By SAMUEL B. BRODER, M. S., M. D.

Accidentally I observed that the intramuscular injection of $7\frac{1}{2}$ grains of caffeine sodiobenzoate, followed by the intravenous injection of $3\frac{3}{4}$ grains of sodium amytal resulted instantaneously in apparently normal behavior of a catatonic patient. This observation led me to investigate the possibilities of employing this method therapeutically since I have not found that catatonic patients respond well to *Dauerschlaf*. Having previously satisfied myself of the importance of psychotherapy coincident with the use of a hypnotic agent in the treatment of psychotic patients, I have also applied intensive psychotherapy in this investigation.

Material.

The experiments were carried out with eight catatonic patients who had been ill for periods of three months to three years. As controls, 16 normal persons and eight psychotic patients (three manic-depressive, two hebephrenic, one paranoid, one psychoneurotic and one unclassified psychosis) who had been ill for similar periods of time were used.

At the beginning of the treatment the eight catatonic patients were mute and rigid; six were incontinent and drooled saliva, and five showed stereotypy of speech or posture.

Of the eight psychotic controls, the three patients with manic-depressive psychoses were mute. Of the hebephrenic patients, one was mute, the other talked only when directed and then only in monosyllables. The paranoid patient talked excessively and spontaneously. The psychoneurotic patient talked spontaneously and when directed, but had a tendency to be aloof. The patient with an unclassified psychosis was mute and aloof.

* From the Psychiatric Institute of the College of Medicine of the University of Illinois, Dr. H. Douglas Singer, Director.

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In order to determine the most effective combination of drugs for the catatonic patients, I used as criteria the effects of a combination of caffeine sodiobenzoate with sodium amytal on: (1) mutism, (2) rigidity, (3) stereotypies of speech and posture and (4) slovenliness. *A priori,* it was assumed that the combination most effective in reversing the aforementioned four conditions would prove to be the method most valuable in the treatment of catatonic patients.

Technic.

The following procedures were used:

1. Caffeine sodiobenzoate (a standard concentration of 2 cc. containing 7½ grains was used throughout) was administered in various quantities, both intramuscularly and intravenously.
2. Sodium amytal in 5, 10 and 20 per cent concentrations and in doses varying from 3¾ to 7½ grains was used alone by the intravenous and intramuscular routes.
3. The injection of 2 cc. of sterile water intramuscularly, followed in from 5 to 15 minutes by the intravenous injection of 3.75 cc. of 0.9 per cent solution of sodium chloride.
4. The injection of from 3¾ to 7½ grains of caffeine sodiobenzoate intramuscularly, followed in from 5 to 15 minutes by 3¾ grains of sodium amytal intravenously.
5. The same as in (4) except that sodium amytal was given intramuscularly.
6. The injection of from 11¼ to 15 grains of caffeine sodiobenzoate intramuscularly, followed in from 5 to 15 minutes by 3¾ grains of sodium amytal intravenously.
7. The same procedure as in (6) except that sodium amytal was injected intramuscularly.
8. The intramuscular injection of from 11¼ to 15 grains of caffeine sodiobenzoate, followed in from 5 to 15 minutes by the intravenous injection of 7½ grains of sodium amytal.
9. The same procedure as in (8) except that sodium amytal was injected intramuscularly.
10. The same doses and concentrations of mixtures except that the order of administration was reversed, *i. e.,* sodium amytal was followed in from 5 to 15 minutes by caffeine sodiobenzoate.
11. Sodium amytal in combination with other stimulants: ephedrine hydrochloride, epinephrine hydrochloride, coramine, strychnine sulphate, atrophine sulphate and camphor in oil; none of these proved effective.

Over 700 injections were given in all; of these over 350 were given to the catatonic patients. The method described as the most effective was used in over 140 instances.

Special studies were limited to the recording of physiologic changes, such as pulse rate, respiration rate and blood pressure readings before the treatment, and at five minute intervals for 20 minutes following the administration of the drugs.

Results Observed.

The injection of caffeine alone and of sterile water intramuscularly and saline solution intravenously failed to produce any demonstrable effect. An intravenous injection of sodium amytal may produce favorable changes in the behavior of a catatonic patient, but in my experience it failed to give consistent, striking or lasting changes. Of all possible combinations, the mixture most effective in bringing about a reversal in mutism, rigidity, stereotypy of speech and posture, and slovenliness in the eight catatonic patients was 7½ grains of caffeine sodiobenzoate injected intramuscularly, followed in about 10 minutes by an intravenous injection of 3¾ grains of a 10 per cent solution of sodium amytal. This particular combination (later referred to as "most effective") produced talkativeness and cessation of drooling of saliva in 95 per cent of instances; in 90 per cent of the trials rigidity and stereotypy disappeared.

Some of the catatonic patients who were treated by the most effective method talked, were relaxed and showed no stereotypy or slovenliness for four or five days following a single injection; others reverted to the original catatonic state only a few hours after the treatment.

I found no direct correlation between the number of treatments and the nature or duration of a favorable response of a given patient, although it may be said that a poor response is more apt to occur during the course of treatment than at the beginning.

The following observation indicates that the time element between the two injections is of the utmost importance. When sodium amytal followed caffeine sodiobenzoate too quickly there was a noticeable time-span before patients began to talk, and on many occasions catatonic patients did not talk at all. On the other hand, when sodium amytal was given some 10 minutes after the caffeine the response in the same patients was usually instantaneous. The reason why the combination of 15 grains (double amount) of caffeine sodiobenzoate with 3¾ grains of sodium amytal did not give

as many striking responses may be the possibility that such changes as are produced in the cerebrum by caffeine are too great to be offset by the small amount of sodium amytal.

When the quantity of sodium amytal was also doubled the unsuccessful results were probably due to the narcotising effect of the large dose of sodium amytal. There are patients in whom a dose of 3¾ grains of sodium amytal will produce narcosis. I have observed two such catatonic patients. Each emitted a groan or a wheezing sound when only 2 grains of amytal had been injected. This was accepted as a signal to stop the injection; when the "signal" was not heeded and 3¾ grains was injected, the patients went into a state of seminarcosis and the results were unfavorable. It should be emphasized, however, that none of the other patients have in any way indicated the precise moment for discontinuing the injection. It is, therefore, worth remembering that after the first two grains of amytal are injected at the rate of 1 cc. per minute (or a little faster) the patient should be observed closely; the instant a previously rigid patient exhibits trembling of the eyelids, movements of the lips, an occasional smile, or jerking of any of the limbs or any other movement, it is better to stop the injection and to shake the patient, speak to him, or falsely accuse the patient; as soon as he responds, withdraw the needle, regardless of the amount of sodium amytal that has been injected, for the objective is to cause a mute catatonic patient to talk.

By the use of the procedure described (caffeine and sodium amytal) it was possible to effect recovery in two catatonic patients. Intensive psychotherapy was applied after each treatment. In two cases in which a psychogenic origin of the disease was evident the patients failed to respond favorably when psychotherapy was not used.

Occasionally the information obtained following each injection threw light on the nature of the breakdown and brought out the psychogenic origin of the illness. The ground gained in a previous interview was not lost when a patient who had relapsed received a further therapeutic injection. This fact is important, because on the surface these patients appear aloof and not in contact with the world—"split off," so to speak—yet in reality they observe and remember many things. One of two recovered patients recalled and related numerous incidents that had taken place during the entire

three months of her illness. She quoted the therapist, nurses and attendants almost *verbatim,* recalling dates and incidents correctly.

One was able to observe the gradual " sinking back " of a patient into his original condition. This gradual process, passing through a sort of clouded or twilight state, in a patient who a moment before had been bright and cheerful, was striking. Artificial stimulation, such as shaking or talking to the patient was effective for only a short time; he soon lapsed into his previous catatonic state.

In my experience a second therapeutic injection at this stage proved highly beneficial, for it enabled me to keep the patient in contact with the environment for a longer time. Because one cannot predict the duration of effectiveness of a single treatment, the patient should be watched closely and when the first signs (lack of interest in the surroundings, rigidity, masked expression, etc.) of a reversal of the original condition manifest themselves the treatment should immediately be repeated. On many occasions I gave the treatment five times in one day in order to keep the patient in contact continuously; at times I resorted to stimulation by caffeine during the night.

Comment.

If for no other reason than to secure significant information from the patient, the production of a remission by some such method of therapy is worthy of trial. I do not wish however, to give the impression that the treatment outlined is a panacea for catatonia—far from it. Even when combined with intensive psychotherapy the method may fail to bring about recovery. The transient improvement that is likely to occur following this method in a previously uncommunicative, rigid, slovenly catatonic patient justifies, I think, its use. The amount of work that it entails is great, and the procedure is so specialized that constant vigilance of a physician is imperative.

The mixture of caffeine and sodium amytal produces changes in a catatonic uncommunicative patient which assist the physician to use psychotherapy effectively and profitably. Whether this combination of drugs alters in some way the cerebral function biochemically or produces shock, as it were, is speculative.

Of the other six catatonic patients, each responded well to individual treatment. Three did not have extensive treatment and

showed only transient improvement. Two of the remaining three catatonic patients were well for two days at a time and the third for longer periods.

The response in the three manic-depressive patients was invariably poor; only one talked occasionally following many injections. The treatment had no effect on the mental status of hebephrenic patients, and no visible effects on the paranoid and the psychoneurotic patients.

The reaction to the treatment in the normal controls was specific. Some cried, others were rather elated; almost all remarked that they felt free of inhibitions, and were more eager to face facts and "get them off their minds." Others revealed innermost secrets and remarked later when told about it, "I felt so happy that I did not want to mar the experience by restraint." A great many felt lightheaded. Many complained of pain at the site of the intramuscular injection and still others of dizziness and blurring of vision.

Caffeine sodiobenzoate, according to Finesinger,[1] produces in animals dilation of the pial blood vessels. Amytal—iso-amyl-ethyl-barbituric acid—also produces dilation of the cerebral blood vessels.[2] The favorable response resulting from the use of these two drugs might be due to the preparation of the blood vessels, as it were, by caffeine sodiobenzoate for the action of sodium amytal, and the possibility that these drugs act synergically and enhance the effect of sodium amytal.

Report of Cases.

Case 1.—A. S., a single, white girl, aged 16, of American birth, who was admitted to the Psychiatric Institute October 10, 1934, came of doubtful stock and her physical endowment was only fair. The family environment was unfavorable; endowment with energy was deficient, but with intellect was good. The patient was retiring, had few friends, was studious and took no part in extracurricular activities. The first change in behavior as noted in July, 1934, when she failed to associate even with her closest friends, talked little with members of the family, did not eat, became disturbed and attempted to drown herself in a bathtub.

In August she was committed to the Cook County Psychopathic Hospital where the case was classified as dementia præcox. At the end of three weeks she was taken home. Five days later she stopped eating, drooled saliva, pulled her hair, ran frequently to the bathroom and splashed water over her breast, arms and wrists. She was admitted to the Psychopathic Hospital and transferred to the Psychiatric Institute, where she was sluggish, resistive, uncooperative, combative, untidy, rigid and mute.

On November 16, 1934, some five weeks after admission to the Psychiatric Institute, *Dauerschlaf* was instituted and continued for 10 days with no noticeable improvement. Because of her tendency to react with a systolic blood pressure of 76 and diastolic pressure of 54, with a pulse rate of 54 per minute caffeine sodiobenzoate was occasionally resorted to. At this point it is worth stressing that caffeine combined with sodium amytal, given orally, failed to produce speech in this patient.

On January 14, 1935, I intended to institute *Dauerschlaf* again. Because of her tendency to react even to small doses of sodium amytal with a drop in blood pressure, 7½ grains of caffeine sodiobenzoate was first given to ward off such a reaction, and some 10 minutes later sodium amytal was injected intravenously. When only three grains of the amytal had been injected the patient, who previously had manifested mutism and flexibilitas cerea, became completely relaxed, opened her eyes and began to talk spontaneously. The injection of sodium amytal was then stopped. The patient was apparently well until the following morning when the condition preceding medication was again evident. On January 15 one injection kept the patient alert, communicative and cooperative during the entire day. On January 16 it required three and on January 17, six such administrations.

During the lucid intervals psychotherapy was used and factual information obtained. It was learned that during the catatonic phase the patient thought herself to be at home with her family and that she constantly feared that some member of her family might be taken away from her; she folded her arms over her breast as if holding all of them in her embrace. Because this explanation was offered by the patient after each treatment, it was deemed logical to send her home where she could be with her parents. Accordingly, on January 20—six days after the institution of this form of therapy—she was sent home. At 4 p. m., the patient was still apparently well; at 7 she complained of being tired. At 8 a. m. on January 21 she still talked, took care of herself and even assisted with housework. That evening she was somewhat stiff, but undressed herself and went to bed. On January 22, the third day at home, she asked a younger sister to go with her for a walk. The patient talked logically and coherently. In the evening she was excited, somewhat rigid and complained of being tired. On the following day, the fourth at home, she appeared normal, showed great interest in friends and volunteered to help a younger sister with her school work. In the evening the patient again complained of being tired but was not rigid. The patient was seen frequently until February 4, 1935, when she was paroled, and at weekly intervals until May 1, 1935, when she was discharged as recovered. Ten months after parole the patient manifested signs of abnormal behavior and was recommitted. On the basis of extensive material obtained from the patient, I think the breakdown was of psychogenic origin. It is probable that if the environment could have been changed and the patient had continued to see the physician at frequent intervals a better adjustment might have been effected and the second breakdown averted.

CASE 2.—The patient, a white woman of American birth, aged 18, whose heredity was doubtful, physical endowment average, energy endowment good until the age of 12, school adjustment good until the breakdown, and intellectual endowment below average, in the latter part of 1932 began to have epileptiform convulsions. About December, 1934, the patient began to eat less, saying: "I want to get sick, I wish I was never born, I would be better off dead than alive." On January 23 she was rigid, and required tube feeding. On February 5 she had a staring expression, drooled saliva and was mute. Nine days later she was admitted to the Psychiatric Institute. On the ward she sat with head bowed, held her hands against her eyeballs, drooled saliva and was rigid and mute.

Treatment with caffeine and sodium amytal was instituted on February 22. She responded to each treatment with speech and relaxation, but continued to press her hands against her eyeballs. After 24 days of treatment, during which the patient received 26 injections, she talked spontaneously and took care of her person, but frequently giggled and played pranks on other patients.

She was paroled on June 17, 1935, and has been well since, except for the epileptiform seizures. Although the classification in this case was psychosis with organic brain disease, it is thought that the psychotic manifestations were those of catatonia.

In an attempt to understand better the effect of a combination of caffeine and sodium amytal I studied the response in a mute dwarf.

CASE 3.—The patient was a woman, aged 26, 54 inches tall, whose body proportions were those of a preadolescent child, and whose features, hair and skin suggested a more advanced age than the chronological one. She had had the usual diseases of childhood without sequelæ, and a severe form of influenza in 1918.

The patient adjusted well in grammar school and in the beginning of her high school career. During the third year of high school she became reticent, retiring and failed in her studies. In 1926 she had lost interest in all outside activities and was extremely irritable. In 1927, at the age of 18, she was taken to the Mayo Clinic where a suspicion of oncoming dementia præcox was entertained.

In 1928 she was committed to a state hospital and remained there for two years with only slight improvement. In 1933 she was committed to another state hospital and in November, 1934, was transferred to the Psychiatric Institute. She had been mute for five years prior to admission to the institute. Her behavior was of low grade, as though there were an arrest in development. The patient showed no interest in her appearance; she had to be dressed, undressed and washed by attendants. With the Stanford-Binet test the I. Q. was less than 30.

Because of mutism and the low I. Q. it was thought that she was peculiarly fit for a study of the effects of the various combinations of caffeine and sodium amytal on ability to perform in arithmetic and in the production of speech.

The arithmetical problems given at weekly intervals were those of addition, subtraction, multiplication and division. The addition problems were from 1 plus 1 to 9 plus 9, the subtraction from 1 minus 1 through all possible variations to 10 minus 9, the multiplication from 1 times 1 to 4 times 9, and division from 2 divided by 2 to 40 divided by 8. In all four classes only one number was constantly changed, the others remaining stationary. There were 81 problems of addition, 47 of subtraction, 36 of multiplication and 25 of division. The upper limits were arbitrarily established as those in which she gave 100 per cent wrong answers when not under the influence of medication. All tests were applied either 30 or 120 minutes after treatment.

The results were computed and compared (graph) on the basis of the number of seconds required to answer correctly the same number of arithmetical problems repeated during a four-day period. The graph shows that in the first, third and seventh tests (controls)—no medication—the patient required more time to perform and gave a smaller percentage of correct answers. Rubrics 2, 4, 5 and 6, which are performances following different combinations of caffeine and sodium amytal, show the most favorable responses of the patient. Of these rubrics 4 (the test was applied 30 minutes after the use of the most effective combination) gave the greatest percentage of correct answers in the shortest time, except perhaps for the addition column. This patient also copied the same passage, at intervals of 30 and 120 minutes after the treatment. It was observed that she performed more efficiently (it took her six minutes as compared with nine to 14) 30 minutes after the intravenous injection of $3\frac{3}{4}$ grains of sodium amytal which was preceded by an intramuscular injection of $7\frac{1}{2}$ grains of caffeine sodiobenzoate. Her attention, as far as could be ascertained, was maintained throughout the experiment. Following the administration of the drugs the patient began to talk; she continued to talk when directed and even spontaneously until death from appendicitis.

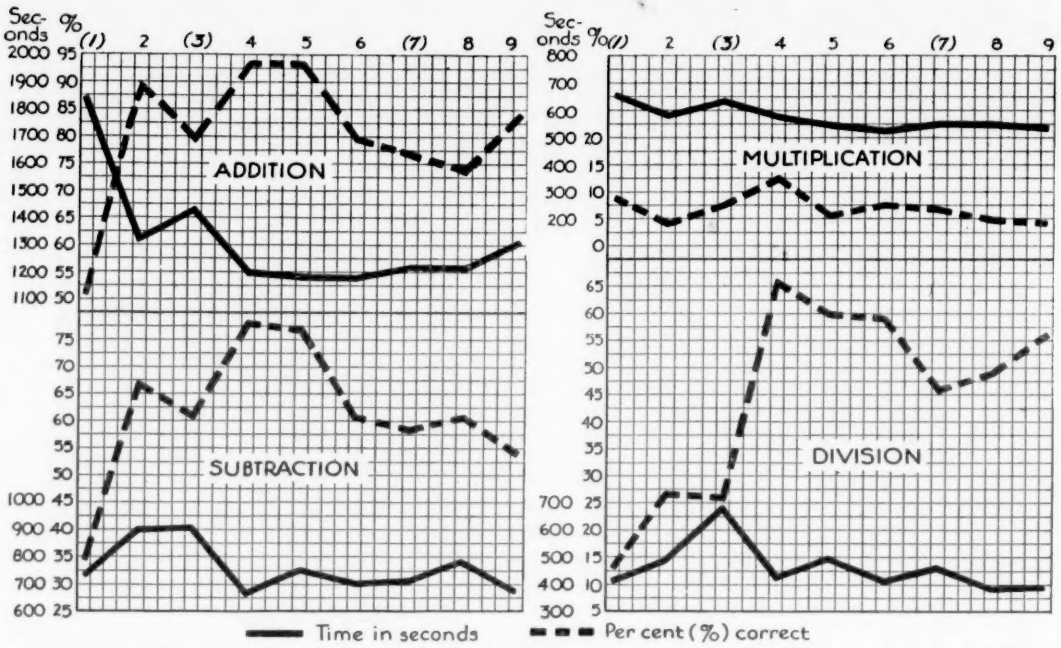
The favorable response observed in test 4 (graph) substantiates, although it does not explain, the contention that this combination is best in bringing about a favorable response in mute patients, as was also observed in catatonic patients. That the improved performance is not the result of a psychologic effect coincident with the injection itself is apparent from the study of test 8, which shows the performance after the administration of plain water and saline solution. The only explanation that I have to offer for the superior performance in test 4 is that it may be due to improved cerebral circulation.

Summary.

1. Over 700 injections of caffeine sodiobenzoate and sodium amytal were administered to 16 patients and 16 normal persons.

2. Of these, over 350 injections were given to eight catatonic patients and nearly 300 to the other eight psychotic patients.

3. Physiologic changes, such as pulse rate, respiration rate and blood pressure readings before the treatment and at five-minute



Variation in Speed and Accuracy in Simple Arithmetical Tests Under Influence of Sodium Amytal With and Without Other Drugs.

The numbers 1, 3 and 7 represent control observations, no medication being administered.
2 indicates the results 30 minutes after the injection of 7½ grains of caffeine sodiobenzoate and 3¾ grains of sodium amytal intramuscularly.
4 indicates the results 30 minutes after the injection of 7½ grains of caffeine sodiobenzoate intramuscularly and 3¾ grains of sodium amytal intravenously.
5 indicates the results two hours after the injection of 7½ grains of caffeine sodiobenzoate and 3¾ grains of sodium amytal intramuscularly.
6 indicates the results two hours after the injection of 3¾ grains of sodium amytal intramuscularly.
8 indicates the results 30 minutes after the injection of 2 cc. of distilled water intramuscularly and 2½ cc. of normal saline intravenously.
9 indicates the results 30 minutes after the injection of 7½ grains of caffeine sodiobenzoate intramuscularly.

intervals for 20 minutes following the administration of the drugs, were recorded, but were too insignificant and too irregular to merit emphasis.

4. The effect of the combination of caffeine sodiobenzoate with sodium amytal when used in certain quantities by certain routes on mutism, rigidity, slovenliness and stereotypy of posture and speech in the catatonic patient is reported.

5. The effects are reported of various combinations of caffeine and sodium amytal on the speed and accuracy in simple arithmetical problems and in copying similar passages by a mute patient with an undiagnosed organic brain disease.

Conclusion.

Intramuscular injection of $7\frac{1}{2}$ grains of caffeine, followed some ten minutes later by intravenous injection of $3\frac{3}{4}$ grains of a 10 per cent solution of sodium amytal is beneficial in producing a change in mutism, rigidity and slovenliness in catatonia. The change may last from a few hours to a few days. Two catatonic patients who were subjected to this form of treatment recovered. No explanation of the cause for the above favorable change is offered. There is no correlation between the number of treatments and the nature or duration of a favorable response.

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6 indicates the results two hours after the injection of $3\frac{3}{4}$ grains of sodium amytal intramuscularly;
8 indicates the results 30 minutes after the injection of 2 cc. of distilled water intramuscularly and $2\frac{1}{2}$ cc. of normal saline intravenously.
9 indicates the results 30 minutes after the injection of $7\frac{1}{2}$ grains of caffeine sodiobenzoate intramuscularly.

Comment.

SERIOUS POLITICAL SITUATION IN MASSACHUSETTS.

The Council of The American Psychiatric Association at its regular winter meeting in New York City, December 28, 1936, took account of recent reactionary political activities in Massachusetts, which have resulted in the displacement of two of the most valued and highly esteemed officials of the state mental hospital service, and the appointment in their places of men whose qualifications for these important posts are probably best known to the then governor who engineered the changes.

The following is an abstract from the minutes of the Council meeting:

The Council discussed and deplored the recent disregard of psychiatric standards in Massachusetts which ignored the needs and rights of the mentally ill and handicapped and which tended to disorganize their care in Massachusetts, and directed the Executive Committee to draft a suitable resolution.

In accordance with this action the following resolution was prepared and approved by all members of the Executive Committee:

At the direction of the Council of The American Psychiatric Association, the Executive Committee prepared the following resolution with reference to the situation in Massachusetts:

Deep concern is felt over the recent appointments in Massachusetts. The best interests of the mentally sick and handicapped and of their distressed families can only be served when those in authority encourage continuity of service and insist on recognized professional qualifications and breadth of experience.

In order that such a policy prevail, steps should be taken to make the real issues clear to those in authority and to the general public.

Be it Therefore Resolved, That the Editor of the JOURNAL insert in an early number an editorial dealing with the situation.

Be it Also Resolved, To bring the situation to the attention of The National Committee for Mental Hygiene in order that constructive steps be taken for the maintenance of those high standards of care of the mentally sick and handicapped in Massachusetts which have given Massachusetts for so long an enviable position among the states.

The high standards and the non-political manner in which the state hospitals of Massachusetts have heretofore been conducted make of more than passing interest the injection of politics into their administration which has recently occurred.

Under the Commissionership of Dr. George M. Kline, a former president of The American Psychiatric Association, who served from 1916 to his death in 1933, the state hospitals of Massachusetts acquired an enviable reputation, not only in the minds of the public of the state, but among psychiatrists and hospital administrators the world over. Massachusetts and New York were pointed to as the leaders in mental hospital administration, both as furnishing a high standard of care for the patient, and in establishing progressive policies along the lines of research and preventive work. The service of the travelling school clinics, the development of child guidance work and the active research programs carried on at Worcester, Boston, Monson and Wrentham need only be mentioned as examples of the leadership furnished by Massachusetts. Thorough studies of hospital construction and planning were carried on, and a statistical organization was developed which is probably the best of its sort. Physicians were sent to Massachusetts for training by other states and countries, and able men were glad to enter the service because they were assured of security and of promotion on a strictly merit basis. Political activity by state hospital personnel was strictly taboo. Superintendents were selected by the boards of trustees with the approval of the Department of Mental Diseases, from physicians of the grade of assistant to the commissioner or higher, these physicians all having first served several years as assistant superintendent of a Massachusetts state hospital before being appointed to the grade of assistant to the commissioner. In this way the junior men had before them the possibility of being promoted eventually to a superintendency if the quality of their work merited it, and an outstanding morale had been developed among the medical personnel by Dr. Kline.

On the death of Dr. Kline, Dr. James V. May, another former president of The American Psychiatric Association, who had been previously commissioner in New York State, and who had then served for sixteen years as superintendent of the Boston State Hospital, the largest in the state, was appointed commissioner. He

resigned in June, 1934, and was succeeded by Dr. Winfred Overholser, who had been successively promoted from the rank of junior physician during seventeen years service, and who had served for four years as assistant commissioner when appointed to succeed Dr. May. The policies described above as having been developed by Dr. Kline were carried on under these two commissioners.

In January, 1935, one James M. Curley, was inaugurated as governor. Mr. Curley had been formerly mayor of Boston, and had never been noted for a high level of statesmanship. He had prided himself upon being "a great humanitarian" and had done much to develop the Boston City Hospital, and it was hoped by many that he would take pride in maintaining the high level of the Massachusetts state hospital service. In his inaugural address he stated that any executive would consider it a "duty and a privilege" to retain in the state service career men and women, and when Dr. Arthur N. Ball was appointed superintendent of the Northampton State Hospital he issued a statement commending the system of promotion which was already a tradition in Massachusetts.

So significant and sincere did Mr. Curley's words appear to be that they were quoted in an editorial in this JOURNAL (May, 1935, page 1445). The correspondence of preaching and practice of a certain type of politician can best be illustrated by recalling here and now, in the light of his subsequent actions, the words of the Governor Curley of 1935. They were:

> The selection of Dr. Arthur N. Ball by the trustees to be superintendent of the Northampton State Hospital is entirely in line with what I believe to be the only sensible policy in such highly specialized institutions as those within the jurisdiction of the State Department of Mental Diseases.
>
> The care and treatment of the mentally ill is an exact science, which calls for highly trained and temperamentally equipped department and divisional officials. The work is difficult and the remuneration is seldom large, and I believe that those men who are giving their lives and talents to this important duty of our state government should be promoted from the ranks when opportunity for advancement presents itself. It is the constant adherence to this policy which has preserved the morale for which our Massachusetts Department of Mental Diseases is known the country over.

As is not infrequently the case with political office holders, preaching and practice did *not* jibe.

The governor's henchmen brought continual pressure to bear on the superintendents to employ politically endorsed personnel,

and when objection was raised voiced criticism of the department as "not cooperating."

In July, 1936, coincidently with the expiration of Dr. Overholser's term of office and also with the beginning of Mr. Curley's campaign for the United States senatorship, Mr. Curley made a visit to the Boston State Hospital early one morning, going directly to certain wards occupied by elderly, untidy women. He refused to allow any of the hospital physicians to accompany him, and ignored Dr. May, the superintendent. On returning to his office he released a statement to the press, professing to have found sheetless beds, dirty floors and ill fed patients, and concluding with the statement, as reported by the press, that Dr. May or Dr. Overholser, or both, must go. The editorial comment throughout the state was to the effect that the attack was obviously political and that the people of the state had confidence in the care accorded to the patients. Later Mr. Curley made an impassioned radio address, urging the disaffected to write to him and detailing the "horrors" of the treatment of the mentally ill. It was also reliably reported that emissaries of the governor's office were active in obtaining from disgruntled employees affidavits of a discreditable nature regarding conditions at the state hospitals.

If Mr. Curley depended on this issue for election to the United States Senate he was mistaken; at least he was overwhelmingly repudiated by the people of the state, losing to a Republican in a Democratic year by over 150,000 votes. Immediately the reaction came. Two days after the election he submitted to the Executive Council the name of one Dr. David L. Williams to succeed Dr. Overholser as commissioner, Dr. Overholser having continued as a holdover since the preceding July. Dr. Williams had never served in a state hospital in Massachusetts or elsewhere. He had been connected with the Veterans' Administration and was in charge of the laboratories at the Veterans' Hospital at Bedford, Mass. He was not a member of The American Psychiatric Association, the Massachusetts Psychiatric Society or of the Massachusetts Medical Society, and had not listed himself in the American Medical Directory as a specialist of any sort. His entire background was essentially one of laboratory work, and at the age of 59 he had had no administrative experience. The presidents of all the District Medical Societies urged the reappointment of Dr. Overholser, of

whose administration no public criticism had ever been made, even by Mr. Curley, and the daily press of the state had editorially urged the reappointment. The Massachusetts Medical Society, through its organ the *New England Journal of Medicine,* outlined the requirements for a commissioner, in most of which Dr. Williams was admittedly lacking. The Executive Council delayed action, but finally, by political legerdemain, the nature of which can only be guessed, confirmation was finally secured, and a man without practical experience in state hospital work, who had even been quoted to the effect that "membership in learned societies had nothing to do with whether a man is a specialist," became commissioner.

But the end was not yet. Mr. Curley had not forgotten what he had said about Dr. May. He invoked an obscure and never before used statute empowering him to confer upon the Department the duties of the Trustees, whereupon Dr. Williams promptly proceeded to remove Dr. May as superintendent of the Boston State Hospital. Rather than engage in what would certainly be a losing fight, Dr. May asked for retirement, and received it. Next, Dr. Williams named as his successor, one Dr. John V. Thuot, a 71-year-old general practitioner, and when this appointment was declared by the Attorney General to be illegal by reason of Dr. Thuot's being beyond his retiring age, Dr. Williams named one Dr. Harold F. Norton, a physician, 35 years of age, who had been on the staff of the Boston State Hospital about three years, and only within a few months promoted to the rank of senior physician. The fact that Dr. Norton is closely related to a well-known Boston politician whose support may be helpful to Mr. Curley if the latter runs for mayor of Boston may account partly at least for the fact that he was promoted over the heads of the assistant commissioner, assistants to the commissioner, the assistant superintendent of the Boston State Hospital, and a number of senior physicians. The effect upon the morale of the state hospital service can well be imagined. Massachusetts, formerly a guide and counsellor to other states, has gone the way of the politician. That the unfortunate patients will pay the bill is of no consequence to the "great humanitarian," nor is the fact that Massachusetts' leadership is no more.

A new governor, His Excellency Charles F. Hurley, is now in office, and is looked to by the decent people of the state to undo some of the damage wrought by his predecessor. It is to be hoped that he will soon take appropriate steps to restore Massachusetts to her former proud position in the sphere of psychiatry.

MENTAL HOSPITAL SURVEY COMMITTEE.

That mental illness now constitutes one of the large medical, social, economic and health problems of the country is not generally appreciated even in medical circles. Concerted medical leadership is required for its solution—a leadership and mutual participation of all national medical agencies whose interests and responsibilities are directly concerned with any or all of the many diversified phases of the problem.

In an effort to coordinate the various interests concerned, a Mental Hospital Survey Committee has been organized, as outlined in an editorial comment in the JOURNAL for September, 1936.

The evolution of public facilities and measures for meeting the needs of the mentally ill in the United States has been characterized by piecemeal growth and development, which have taken place to a considerable extent without regard to basic medical facts or medical guidance. In consequence, some community needs have been fulfilled while others have been neglected. This lack of uniformity is the result in part of the manner in which our country has developed. Paradoxical as it may seem, our national development along these lines has been characterized by sporadic activities of greed and exploitation, mingled with expressions that seem to satisfy the humane instinct for placing the neglected, the weak and the afflicted in the way of hope and strength.

Institutional measures of one kind or another have made tremendous appeals to this instinct and have often represented all of the obligations that the community has assumed in behalf of the afflicted. Institutional facilities alone, while important, are insufficient to meet the needs of the mentally ill. Changing conditions in our social order have imposed broader obligations upon communities which involve more expert medical service and more satisfactory measures and facilities to meet these needs.

It has long been apparent that no legislature has kept pace with the demands of the situation. The philosophy of the American people may be responsible in part for the varying standards of the care afforded. This philosophy, which has always been a factor in the operation of any tax-supported institution, consists in avoiding the public burden as long as possible and when it is finally charged, in accepting the minimum responsibility. A uniform public recognition of the needs of the mentally ill is not possible immediately because of the varying degrees with which this traditional American political philosophy is accepted.

In some jurisdictions, responsibilities for the care of the mentally afflicted have been assumed to a greater degree than in others. In jurisdictions where these responsibilities have been recognized, there are often varying standards when two or more similar services are compared. The differences are due to a wide variety of factors, not the least of which is the personal equation in the local professional leadership.

Personal equation, however, is only one consideration, for it is known that many public mental hospitals are restricted in their ability to render service by the limited funds available. Public appropriations tend to reflect the communities' conception and understanding of the needs. An enlightened understanding of the functions of a public mental hospital would certainly contribute eventually to more adequate financial support. This can be accomplished best through concerted medical leadership. The creation of such an understanding is not only of concern to the Survey Committee and the specialized professional groups who are devoting their lives to the problems of mental illness but it concerns also the entire medical profession.

All of the members of the committee are fellows of The American Psychiatric Association and diplomates of The American Board of Psychiatry and Neurology. The membership of the organization now known as The American Psychiatric Association has always stood for progress in the solution of the problems of mental illness and has made tremendous contributions to this field. The annual addresses of successive presidents of The American Psychiatric Association have for almost a century touched upon the care of patients in public mental hospitals and the functions

which these institutions should perform. No small part of the annual programs of this Association has been devoted to these subjects.

The interest of the Association was furthered in this direction by the publication, "The Institutional Care of the Insane in the United States and Canada," by Dr. Henry M. Hurd, Dr. William F. Drury, Dr. Richard Dewey, Dr. Charles W. Pilgrim, Dr. G. Alder Blumer and Dr. T. J. W. Burgess. The membership of the Association contributed toward the publication of this work which was issued in four volumes by the Johns Hopkins Press in 1916.

At the 1924 meeting of the Association, resolutions were adopted directing the committee on standards and policies to report the following year a schedule of the minimum standards which it was thought hospitals for mental diseases might be "reasonably expected to establish and maintain." The nineteen points recommended by that committee under the able leadership of Dr. William L. Russell are familiar to the members of the Association. At an annual meeting held in Washington, D. C., in 1935, a resolution was proposed by Dr. C. Charles Burlingame that the council authorize the executive committee of the organization to proceed with the classification and grading of the public mental hospitals of the United States and Canada.

Other agencies, aside from The American Psychiatric Association have been interested in this problem. The membership of The American Neurological Association has always stood for improved standards for the recognition, care and treatment of neurological diseases. The neurological clinical material found in wards of public mental hospitals offers opportunity for study and investigation and should serve for training young men who are to engage in the specialties of psychiatry and neurology. There is a dearth of facilities in the United States for adequate training in organic neurology.

It is apparent from a practical point of view that men who are to engage in the field of psychiatry must necessarily have some understanding of neurological diseases and those who are to engage in the practice of neurology should have some knowledge of mental diseases. It is a reasonable hope that young men entering the fields of psychiatry and neurology may be trained in both

specialties so that this arbitrary and artificial division may be removed. For this accomplishment more centers will have to be established for the training of organic neurologists.

The wide variety of organic neurological material in practically every public mental hospital makes it desirable to develop such institutions with this objective in mind. In this way every state would have adequate facilities for teaching undergraduates and graduates in these two allied fields instead of the widely scattered centers which exist at the present time.

Not only has The American Neurological Association been interested in these matters but the newly created American Board of Psychiatry and Neurology was confronted with the necessity of taking account of the facilities available in public mental hospitals for instruction in the two specialties involved.

The National Committee for Mental Hygiene for almost three decades has been interested in bringing about improved standards in the public care of mental diseases. It had its beginning with this objective in mind. The recent development of the division of hospitals in the National Committee makes possible the utilization of that machinery in connection with the proposed activities of the Survey Committee.

The American Medical Association is directly concerned with the adequacy of facilities for hospital interneships and residencies not only in the field of general medical education but in the specialist's field as well. In the past three decades its Council on Medical Education has revolutionized medical education in this country. Dr. William D. Cutter, executive officer of the Council, officially attended the meeting of the Committee on June 29, 1936, taking part in the discussion and explaining the aims and objectives of the Council. His willingness to cooperate with the Committee and the opportunity offered to mutually exchange viewpoints in this particular field, articulated as it must be with the broader aspects of medical education, was gratifying and helpful to the several members of the Committee.

The American Medical Association, while not directly concerned with the administration of mental hospitals or in methods of diagnosis and treatment of mental cases—features belonging in the field of the psychiatrists—is, nevertheless, interested in the

general problems of hospital administration and function. Through its Council on Medical Education and Hospitals, it has long been concerned with medical education in its broader aspects including both graduate and undergraduate instruction in psychiatry and neurology; and it is logical to assume that The American Medical Association is aware of the need that the medical profession as a whole should be informed of facts which heretofore were disseminated mainly among specialists.

An analogy has been drawn between the present position of psychiatry and aseptic surgery of thirty or more years ago. Thus, aseptic surgery solved the problem of removing an offending appendix. Until the general medical man learned to make the diagnosis before it was too late, the general public did not reap the benefits of this improved technic. Similarly, the general practitioner of today must be alert to recognize the earliest symptoms and contributing factors in mental disease, if the fruits of progress in psychiatry are to be made generally available. He must also know what constitutes adequate care of the mentally ill. The medical profession generally and specialists in particular cannot stand aloof from these obligations, for the standards and policies of dealing with the mentally ill of a community or political jurisdiction will reflect favorably or adversely upon professional standards generally. The entire medical profession, including public health agencies, must join hands in an endeavor to better solve the problems of mental illness.

During the past half century public health measures have been applied intensively to the prevention of deaths from communicable diseases and to the lessening of mortality in infancy. With progress in the prevention of needless deaths, attention of public health workers is being awakened to the basic fact that the health of communities depends, not only on the survival of the individual, but also on the amount and character of sickness in a population. It is a fact that diseases most frequently resulting in death are not necessarily those causing the most illness and incapacity, and that death rates alone cannot be regarded as an accurate index of the health and vitality of the people. In the development of a modern health program it is not deaths and longevity alone that should serve as health criteria, but the incidence and records of sickness must be taken into account also.

The need for broadening the scope and outlook of public health measures will be better appreciated when it is realized that the future and security of a nation depend a great deal on the health of its citizens. This cannot be left wholly to individual endeavor, and measures and policies must be adopted eventually for more closely integrating individual medical services with those concerned with the prevention of disease and ill health. It is evident that an agency like the United States Public Health Service must eventually assume a more permanent and active rôle in this particular field. The time has arrived when a national health agency must take cognizance of the need for greater uniformity and more equal distribution of facilities and measures for the treatment or amelioration of mental ill health, and also in that problem which relates to the development of personnel to undertake duties of this character.

At the meeting held in New York City on June 29, 1936, the Survey Committee, after discussing the scope of its activities, decided that for the time being at least it would be necessary, largely because of financial reasons and dearth of personnel, to confine the survey to public mental hospitals caring for the insane, the feebleminded and the epileptic, and including privately endowed institutions of this character. It was also the consensus of opinion that the survey of public mental hospitals should deal first, with determining the present status of the administrative organization existing in a political jurisdiction and its functions; second, with an analysis of the economic problems involved; third, with availability of records for evaluating and comparing the omissions and commissions of a given public policy; fourth, with evaluation of the adequacy of institutional structures and equipment; fifth, with the adequacy and competence of professional, sub-professional, and technical personnel; sixth, with measures and facilities for the conduct of research; and seventh, with the adequacy of facilities and policies for graduate and undergraduate instruction in neurology and psychiatry.

The chairman was authorized to appoint an executive committee having in mind the need for representation from each of the participating agencies and also the economic problems in connection with travel. The executive committee was subsequently

appointed consisting of Dr. Walter L. Treadway, chairman *ex-officio*, of Washington, D. C., Dr. Winfred Overholser of Boston, Massachusetts, Dr. Louis Casamajor of New York City, and Dr. J. Allen Jackson of Danville, Pennsylvania. It is possible that at a subsequent date sub-committees dealing with certain phases of the Committee's interest will be appointed.

The medical director, Dr. Samuel W. Hamilton, and the associate medical director, Dr. Grover A. Kempf, have, since the first of September, been conducting some brief experimental surveys for the purpose of determining advantageous and practicable methods.

The executive committee met in New York City, September 27, 1936, for the purpose of considering certain administrative problems confronting the Survey Committee.

It was agreed that for the present the Committee's interest should be concentrated on an orientation of the problem, first, by an analysis of the adequacy of the professional personnel engaged in the care and treatment of mental diseases; second, by an analysis for determining the present status of the administrative organizations existing in the several political jurisdictions and the functions which such organizations actually perform; third, by an evaluation of the adequacy of institutional facilities and personnel for the intensive treatment of newly admitted persons to mental hospitals, with special reference to services rendered during the first year of residence.

It is anticipated that the survey of the personnel situation and the functions of the administrative organizations will be undertaken immediately and that studies of the measures for meeting needs of early cases, which is much broader in scope, will be carried on synchronously with the above. Further consideration was given to the possibility of the appointment of a sub-committee to deal with questions of medical education in psychiatry and neurology, with special reference to the matter of approving institutions for interneships and residencies, the sub-committee to cooperate with the Council on Medical Education and Hospitals of the American Medical Association. The chairman was instructed to appoint such a committee.

The executive committee was approached as to the feasibility or desirability of extending an invitation to The Canadian National

Committee for Mental Hygiene and The Canadian Medical Association, to become participating agencies in the hospital survey. The executive committee approved such a proposal with the understanding that any expenses involved in connection with special studies in the Dominion of Canada would be defrayed by The Canadian National Committee for Mental Hygiene. Accordingly, The Canadian National Committee for Mental Hygiene and The Canadian Medical Association were invited to become participating bodies and were requested to appoint one or more representatives to serve on the Survey Committee.

W. L. T.

News and Notes.

DIPLOMATES OF THE AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY, INC.—At a meeting of the American Board of Psychiatry and Neurology in New York City, December 30, 1936, the following candidates were certified as meeting the requirements of the Board and entitled to receive its diploma.*

CERTIFIED ON RECORD—CLASS I.

NEUROLOGY AND PSYCHIATRY.

Ball, Erna D.	New York, N. Y.
Davis, Thomas Kirby	New York, N. Y.
Drysdale, Harry Hedgewick	Cleveland, Ohio.
Elliott, B. Landis	Kansas City, Mo.
Evans, Miner H. A.	Boston, Mass.
Feinier, Laurent	New York, N. Y.
Garrick, Nathan H.	Boston, Mass.
Gayle, Robert Finley, Jr.	Richmond, Va.
Gibson, Edward Thomas	Kansas City, Mo.
Goodhart, S. Philip	New York, N. Y.
Griffin, Daniel Patrick	Bridgeport, Conn.
Horger, E. L.	Columbia, S. C.
Huddleson, James Howard	New York, N. Y.
Ingham, Samuel P.	Los Angeles, Calif.
Jordan, Michael M.	Worcester, Mass.
Leavitt, William	Brooklyn, N. Y.
Marsh, Chester Adam	Selinsgrove, Pa.
McDaniel, Frederick Leonard	Washington, D. C.
McKendree, Charles A.	New York, N. Y.
Moersch, Frederick P.	Rochester, Minn.
Myerson, Abraham	Boston, Mass.
Nathan, David	Philadelphia, Pa.
Potter, Howard Wieland	New York, N. Y.
Redwood, Frank Harrell	Norfolk, Va.
Renner, Dan Smith	Skillman, N. J.
Stanton, James M.	Detroit, Mich.
Tucker, Beverley Randolph	Richmond, Va.
Wender, Louis	New York, N. Y.
Yawger, Nathaniel S.	Philadelphia, Pa.

*For lists of diplomates previously certified by the American Board of Psychiatry and Neurology, see the March and July 1936 issues of this JOURNAL.

PSYCHIATRY.

Baskett, George T.....Retreat, Pa.
Blair, Orland Rossini.....Clarks Summit, Pa.
Bowman, Karl M.....New York, N. Y.
Briggs, L. Vernon.....Boston, Mass.
Brush, Nathaniel Hawley.....Santa Barbara, Calif.
Bryan, William A.....Worcester, Mass.
Dayton, Neil Avon.....Boston, Mass.
Gilmore, Charles Marc.....New York, N. Y.
Glueck, Bernard .....New York, N. Y.
Gregg, Donald .....Wellesley, Mass.
Hadley, Rollin Van Nostrand.....Westboro, Mass.
Houloose, James .....Long Beach, Calif.
Kjaerbye, C. P.....Fresno, Calif.
Kolb, Lawrence .....Lexington, Ky.
Kradwell, William T.....Wauwatosa, Wis.
Lang, Walter Emery.....Westboro, Mass.
Moore, Frederick P.....East Gardner, Mass.
Rea, Albertine Louise.....Chicago, Ill.
O'Neill, James N.....Harrison, N. Y.
Russell, William Logie.....New York, N. Y.
Sandy, William Charles.....Harrisburg, Pa.
Taylor, Marianna .....Boston, Mass.
Terhune, William Barclay.....New Canaan, Conn.
Thom, Douglas Armour.....Boston, Mass.
Truitt, Ralph Purnell.....Baltimore, Md.
Wile, Ira S.....New York, N. Y.
Williams, Frank Fay, Jr.....Patton, Calif.
Wiseman, John Ignatius.....Torrance, Pa.
Wiseman, Katherine-Slattery .....Torrance, Pa.
Wittels, Fritz .....New York, N. Y.

NEUROLOGY.

Adson, Alfred W.....Rochester, Minn.
Craig, Winchell McKendree.....Rochester, Minn.
Fletcher, George B.....Hot Springs, Ark.

CERTIFIED AFTER EXAMINATION—CLASSES II AND III.

Neurology and Psychiatry.

Alexander, Leo ..... Boston, Mass.
Alpers, Bernard J ..... Philadelphia, Pa.
Aring, Charles Dair ..... Cincinnati, Ohio.
Baker, Henry Merton ..... Boston, Mass.
Bamford, Thomas Edwin, Jr ..... New York, N. Y.
Bloomberg, Wilfred ..... Boston, Mass.
Crispell, Raymond S ..... Durham, N. C.
Denker, Peter C ..... New York, N. Y.
Green, Isadore ..... Boston, Mass.
Kindwall, Josef Alfred ..... White Plains, N. Y.
Loman, Julius ..... Boston, Mass.
Royowski, Bernhard Albert ..... New Haven, Conn.
Rubinstein, Hyman Solomon ..... Baltimore, Md.

Psychiatry.

Baker, Elsworth Frederick ..... Marlboro, N. J.
Burns, Maudie Marie ..... Middletown, Conn.
Campbell, M. Madison ..... New York, N. Y.
Colomb, Henry Octave ..... Middletown, Conn.
Daniels, George Eaton ..... New York, N. Y.*
Gaulocher, Archibald Martin ..... Wingdale, N. Y.
Guertin, Diomede ..... Marlboro, N. J.
Halloran, Roy Dennis ..... Waltham, Mass.
Helfand, Max ..... New York, N. Y.
Kiene, Hugh Edward ..... Providence, R. I.
Lott, George McClelland ..... Providence, R. I.
Murdock, Harry Merrill ..... Towson, Md.
Perkins, Clifton T ..... Boston, Mass.
Schnap, Isidore ..... Kings Park, L. I., N. Y.
Schneider, Lawrence Edward ..... Warren, Pa.
Stein, Calvert ..... Palmer, Mass.
Warburg, Bettina ..... New York, N. Y.
Wolberg, Lewis Robert ..... Kings Park, L. I., N. Y.
Wolfe, Theodore P ..... New York, N. Y.*

Neurology.

Hernandez, Rafael ..... Nashville, Tenn.
Schneider, Antoine ..... Washington, D. C.

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* Previously certified in neurology.

AMERICAN ORTHOPSYCHIATRIC ASSOCIATION MEETING.—The fourteenth annual meeting of the American Orthopsychiatric Association takes place February 18 to 20, 1937, at the Roosevelt Hotel in New York City. Dr. Edgar A. Doll, of the Training School at Vineland, N. J., is president of the Association, and the secretary is Dr. George S. Stevenson, who may be adressed at 50 West 50th Street, New York City.

INFORMATION SERVICE FOR RESEARCH WORKERS IN HUMAN GENETICS.—The British Bureau of Human Heredity, in announcing this service, makes the following statement:

One activity contemplated in setting up the Clearing-House for Human Heredity is the organization of information service for research workers in the subject. The value of such a plan has been demonstrated in the information service already established for workers on Drosophila, etc. It should be noted that apart from convenience of ascertaining easily centres at which comparable work is going on, the circulation of notice by those engaged in a particular enquiry of their work is a safeguard in dating priority —a point to which it is natural to attach some importance.

Workers are requested to address to the Bureau a short paragraph describing the work on which they are engaged. These notices will be multiplied and circulated to all those co-operating. In the first instance this bulletin will be issued every twelve months. Later supplementary bulletins will be issued more frequently.

Those using this service are asked to subscribe 5/-, a sum equalling approximately one quarter of a pound sterling equivalent in the currency of their country.

The accepted languages are: French, German, English.

Correspondence may be addressed to the secretariat at 115 Gower St., London, W-C. 1.

"INSULIN SHOCK" TREATMENT FOR SCHIZOPHRENIA.—The Committee on Public Education of The American Psychiatric Association has issued the following statement:

The widespread publicity, including radio dramatization of the so-called "insulin shock" treatment for schizophrenia or dementia præcox has resulted in many inquiries being directed to the Committee on Public Education of The American Psychiatric Association, as to the curability of dementia præcox and of this form of treatment in particular.

The impression that there never has been and is now no treatment for dementia præcox except through insulin therapy is entirely erroneous. While

dementia præcox has a less favorable outlook than many other forms of mental illness much has been done and there are many forms of therapy each promising something.

It is hoped, and may prove to be a fact, that the so-called insulin shock treatment for dementia præcox will find a useful place among the forms of treatment, but its exact value has yet to be determined and it can be stated definitely that it is not a specific, nor by any means a cure for all cases of dementia præcox.

It would be a source of regret should the insulin shock treatment be a means of holding out a false hope to the families of the tens of thousands of sufferers from dementia præcox when this hope most certainly cannot be widely realized with present day knowledge of insulin therapy. It is, however, at the present time receiving careful study in the New York and Massachusetts State Hospital systems, Bellevue Hospital, New York and other scientific centers, but it should not be undertaken except by those adequately trained to meet the dangers connected with the treatment.

Members of the Committee on Public Education include the following:

Dr. C. C. Burlingame, Clinical Professor of Psychiatry at Yale University; Psychiatrist-in-Chief, Neuro-Psychiatric Institute of the Hartford Retreat. Dr. Adolf Meyer, Professor of Psychiatry, Johns Hopkins University, Director, Phipps Clinic, Baltimore, Md. Dr. William A. White, Professor of Psychiatry, George Washington University; Superintendent, St. Elizabeth's Hospital, Washington, D. C. Dr. Oscar Raeder, Professor of Psychiatry, Boston University, and Chief, Outpatient Department Boston Psychopathic Hospital. Dr. Karl Bowman, Pofessor of Psychiatry, New York University Director, Bellevue Hospital, New York.

The statement was approved by all members of the committee and by the President of The American Psychiatric Association, Dr. C. Macfie Campbell, Professor of Psychiatry, Harvard University and Director, Boston Psychopathic Hospital.

TWENTY-SEVENTH ANNUAL MEETING OF THE NATIONAL COMMITTEE FOR MENTAL HYGIENE.—The proverbial drawing power of public conferences on mental health was demonstrated anew by the large attendance attracted to the 27th annual luncheon meeting of The National Committee for Mental Hygiene held at the Hotel Roosevelt in New York City on November 12, 1936. The assemblage of over 800 members and guests, suggestive of the National Committee's twentieth and twenty-fifth anniversary meetings and surpassing the attendance on those occasions, surprised

even the executive staff who found it necessary to make last-minute arrangements to shift the luncheon to the Grand Ballroom from the salon originally engaged for the event. No less gratifying was the keen interest manifested by the gathering in the program and its cordial response to the speakers who reflected in their discussions the accelerated activity in organized mental health work that has taken place during the past year following the general improvement in economic conditions.

The meeting was opened with a tribute to the late Dr. Frankwood E. Williams, former medical director of the National Committee, presented by Dr. Marion E. Kenworthy, director of the Mental Hygiene Department of the New York School of Social Work, following which addresses were made by Professor C. E. A. Winslow of Yale University School of Medicine; Dr. Bernard Sachs, former president of the New York Academy of Medicine and chief of the Division of Child Neurology of the New York Neurological Institute; Dr. Nolan D. C. Lewis, director of the New York State Psychiatric Institute and Hospital; and Dr. Clarence M. Hincks, general director of the National Committee. Dr. Arthur H. Ruggles, president of the National Committee, presided.

That the National Committee is, happily, also emerging from the depression, was indicated by the extent and importance of its new undertakings along various lines. Reviewing these activities and the general trend of the organization's work, Dr. Hincks showed how its interests have developed to meet the changing demands of its expanding field. "Our first concern," he said, "was the mental hospital, and for many years we were engaged in the task of assisting in the transformation of the old custodial asylums into centers providing humanitarian care and scientific attention to the problems presented by the patient population. Our next interest was the development of out-patient clinics, with special arrangements for children, and the building up of psychiatric and social work personnel to man these clinics. In this pioneering work, initiated by Clifford Beers and carried forward with such energy and effectiveness first by Dr. Thomas Salmon and later by Dr. Frankwood Williams, it was demonstrated that mental hygiene progress could be achieved by utilizing the services of well-qualified men and women who, through travel and manifold contacts, were enabled to familiarize themselves with the best practices and the

most promising leads in our field." Thus the National Committee became a consultation bureau, with its consultants prepared to visit any part of the country, to study the particular needs and possibilities of any locality, and to sit in friendly council with those who were charged with administrative or professional responsibilities. And these pioneers, appreciating the fact that mental hygiene advance was dependent in no small measure upon the support of the taxpayers, also organized programs of public education to whet hunger for adequate facilities.

Today, Dr. Hincks pointed out, while these activities are still going on and are being further developed in certain aspects, the center of interest has shifted to research, the training of workers, the protection of the mental health of school children, and the development of broad community programs for mental hygiene. "Thanks to the generosity of great Foundations, of the Scottish Rite Masons, and of liberal citizens," he continued, "we have been enabled to finance and organize strong divisions in connection with each of these special interests, with capable directors and executive associates in charge, and with the collaboration of advisory committees composed of recognized leaders. The story of the work of each of these divisions presents a fascinating picture of worthwhile endeavor that is materially affecting outlook and practices in medicine, education, social work, nursing and many other fields. Our periodical News Letter is available to all of you who would like to be kept informed concerning our divisional activities." While continuing its interest in the mentally ill, he added, the National Committee seeks also to extend its activities in the direction of prevention and life enrichment, by engaging in the furtherance of research and therapeutic programs "not only for the benefit of the maladjusted themselves, but also for the insights that can be gained through such work and put to practical account in keeping well people well and in enriching the lives of our citizens generally."

How significant the mental hygiene program has become for public health was brought out in Dr. Winslow's illuminating appraisal of progress and outlook in this broad field. The nineteenth century, he said, gave to mankind a better understanding and a far-reaching control of the material forces, and biological science has enabled man to reduce by nearly one-half the burden of disease

and death. The next major problem, as he saw it, is the extension of understanding and control in the field of the human mind and human emotions. "It is here that the great problems of today are found," he said. "It is here that the future of civilization must be determined. The twentieth century will, I believe, take its place in history as the great period of advancement in this area of knowledge."

Urging a closer integration of mental hygiene in the public health program, Dr. Winslow visualized mental illness and mental handicaps of all sorts and degrees as imposing upon society a burden equal to that produced by all other minor forms of illness put together. "We are dealing here, then, not with a small fraction but with perhaps one-half of the total health problem of society." Public health, he added, means more than vital statistics, and health promotion more than disease prevention. Fullness of living is the big objective. From this standpoint he regarded mental hygiene not only as concerned with hospitals for the insane and the feeble-minded, with behavior clinics and child guidance, but as "a permeating influence in our entire educational and social system, subtly changing every man's attitude toward himself and toward his fellow man."

Dr. Lewis discussed the program of research in dementia præcox established two years ago under the direction of The National Committee for Mental Hygiene, with financial aid from the Scottish Rite Masons, Northern Jurisdiction. Characterizing dementia præcox as "perhaps the largest problem in our present-day society," he saw in this project the beginnings of the most thorough and concerted attempt ever made to solve this problem. Indicating the scope and magnitude of the problem, he said there are many details to be studied and evaluated in organizing research of this character, such as the aptitude and training of investigators, the time element, the funds and facilities available, bibliographic work, the establishment of working hypotheses, reducing a given problem to its simplest terms, and the relation of new projects to previous investigations in this field. Among the guiding principles employed in his formulations, Dr. Lewis mentioned the following:

> We wish to move forward by a process of evolution and not by revolution. In this way we can utilize much that has gone before. Revolution discards all that is old, evolution uses it. . . . . We wish to build a research organ-

ization that will stimulate and encourage investigators to put forth their best efforts. Many places and people capable of working in this field are now suffering from what I like to call "accidia"—a state of mind which I would define as an occupational disorder of the contemplative life, a state of inertia, a bleak lack of interest and at least a temporary suspension of faith. Some of these can be revived, and many are being revitalized. . . . .

We must train and aid the younger, capable men who are contemplating leading a life of research, and must point out to them the opportunities in our specialty and in what way investigations in the fundamental sciences may contribute to our final solutions . . . . The research organization must become a center of information regarding these problems. It must become the center of bibliographic reference, it must know the whereabouts of literally hundreds of research workers, what they are doing, their special interests, what new disciplines are being evolved and how they may contribute to our activities. . . . . And we must cultivate an attitude of tolerance for a wide variety of approaches and studies.

Defining the "ideal research men," Dr. Lewis stressed as essential elements a trained intelligence and the tools he works with, three of which he considered all important, namely, the faculty of constructive imagination, the art of faculty of logical reasoning, and the faculty of observation.

Dr. Sachs spoke on "Research in Relation to Problems of Early Life," urging the importance of studying carefully, and without bias, the earliest manifestations of personality changes and oddities of behavior, especially in children of families in which mental disease recurs. "Much may be done," he said, "in the way of sober determination of facts, without attaching undue importance to theories, which may have a present vogue, or without reiterating beliefs which are to prove or disprove certain doctrines."

In this connection Dr. Sachs referred to the "Child Neurology Research" project, of which he is the Director, and the organization of which had been recently entrusted to him by the Friedsam Foundation. The Council which is advising the project, he said, would welcome original research along psychologic or psychiatric lines "that will definitely advance knowledge in this field."

AFFILIATION WITH THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—By direction of the Council of The American Psychiatric Association, approved at the annual meeting, May 5, 1936, the Secretary made application to the American

Association for the Advancement of Science for affiliation with that body. Notification has been received from Dr. Henry B. Ward, Permanent Secretary of the American Association for the Advancement of Science, Smithsonian Institution Building, Washington, that The American Psychiatric Association was accepted on October 25, 1936, as an affiliated society. This relationship entitles our Association to one representative in the Council of the American Association for the Advancement of Science.

THE WOODS SCHOOLS DISCUSSION CONFERENCES.—The Child Research Clinic of the Woods Schools (Langhorne, Pa.) announces two discussion conferences on "The Exceptional Child at Home and at School," for the spring of 1937. The first of these conferences will be held at the Mayflower Hotel, Washington, D. C., Saturday afternoon, February 27, at 2.30; the second conference will take place at the same hour at the Vanderbilt Hotel, New York City, Saturday, March 20. The practical educational and home problems of the unusual child will be dealt with at these conferences which are open to all interested in the subject.

Information may be obtained by addressing Irene S. Seipt, director, Child Research Clinic, The Woods Schools, Langhorne, Pa.

POSTGRADUATE COURSE AT THE MENNINGER CLINIC.—The medical staff of the Menninger Clinic will conduct its third annual Postgraduate Course on *Neuropsychiatry in General Practice,* April 19 to 24, inclusive, at the Menninger Clinic, Topeka, Kansas. The course this year will include a brief introduction to the fields of neurology and psychiatry and a specific application of this knowledge to the large group of cases of psychoneuroses, psychoses and psychogenic and neurological disorders which every physician meets in his daily practice. Suggestions made by those who took the course last year have been embodied in this year's program in order to make it applicable to the most common practical problems of the physician.

As in previous years, several guest speakers, prominent in the fields of neurology and psychiatry, will appear at the evening sessions of the course.

THE COMMONWEALTH FUND EIGHTEENTH ANNUAL REPORT.—In its annual report for 1936, the Commonwealth Fund records appropriations amounting to $1,967,153.26, intended, in the words of its founder, Mrs. Stephen V. Harkness, "to do something for the welfare of mankind." Both income and appropriations for 1936 were larger than those of recent years, the gifts being the largest since 1931.

More than two-thirds of the total was devoted to the betterment of health. Grants were made for public health service to rural communities, rural hospitals, medical education, and medical research. Postgraduate education in medicine was emphasized, the Fund believing that such work is of major importance in improving the quality of medical service.

For the first time in several years a large share of these appropriations went to educational institutions in New York City. As part of its mental hygiene program the Fund also contributed to educational activities at the Babies Hospital and the New York Hospital. In both, full-time psychiatric consultation has been provided for staff and students in pediatrics. These grants are based upon the belief that a knowledge of child behavior and of emotional factors in children's diseases is an important asset in the medical care of infants and children. A similar project at the Children's Hospital in Boston is also being supported by the Fund.

Aid was given to the study of the structure and development of the brain at the Neurological Institute, New York.

Appropriations were made for the training of psychiatrists and psychiatric social workers as a contribution to the progress of mental hygiene in the United States. The Fund shared in the support of a central bureau of information about child guidance, under the auspices of the National Committee for Mental Hygiene, and of a study of psychiatric education.

Through its own Division of Publications the Fund issued six new books having to do with public health, medicine, psychology, and legal research.

At the close of the fiscal year, September 30, 1936, the invested assets of the Fund had a book value of $42,607,226.31 and a market value of $41,039,182.93.

The directors of the Fund are as follows: Edward S. Harkness, president; Malcolm P. Aldrich, Samuel H. Fisher, William M. Kingsley, Robert A. Lovett, George Welwood Murray, and Dean Sage.

GRADUATE SCHOLARSHIPS, TEACHERS COLLEGE, COLUMBIA UNIVERSITY.—Teachers College, Columbia University, offers for the year 1937-38 a limited number of scholarships and teaching fellowships for graduates of normal schools and colleges and for teachers now in service in fields of the handicapped who wish to continue their study programs in a combination of courses given at Teachers College, Columbia University. These scholarships are open to teachers and workers in the following three fields: (1) teachers and administrators in special institutions for the physically, mentally, or socially handicapped—for example, in institutions for the education of the blind, the deaf, the crippled, and the mentally handicapped; (2) nurses, social workers, psychologists, psychiatrists, vocational counselors, placement officers and administrative officers in public or private agencies dealing with the education, rehabilitation, and vocational placement of the handicapped; and (3) teachers and supervisors of special classes for the physically or mentally handicapped in public or private schools for the general school population.

Scholarship awards may include tuition, maintenance, and cash stipends. The amount of the stipend will vary with the individual case. Scholarship awards will be based solely on the merits of the applicant and the amount of money available for grants. Appointments are made for one year on a probational basis, but may be canceled at the end of any session in event of inferior work.

Programs of study may be arranged leading to the degree of Bachelor of Science, Master of Arts, Doctor of Philosophy, or Doctor of Education, and/or an appropriate Teachers College professional diploma. The requirements in general for degrees and professional diplomas are given in the Teachers College Announcement.

The technical, practical, and professional work is given jointly by Teachers College and cooperating institutions and agencies for the physically, mentally, or socially handicapped. Specialists in the

several fields participate in courses at the College and in field and laboratory courses in the several cooperating institutions or agencies.

Application forms for scholarships and fellowships may be obtained by writing to the Office of the Secretary, Teachers College, Columbia University, 525 West 120th Street, New York City; attention Professor Merle E. Frampton. Applications must be filed not later than May 1, 1937.

Washington Conference on Venereal Disease Control.—The American Medical Association in the January 9, 1937 issue of its journal reports on the proceedings at this Conference, called by Surgeon General Thomas Parran of the United States Public Health Service, and attended by more than five hundred persons representing the American Medical Association, officers of state medical societies, health officers, practising physicians and social workers. The Conference continued for three days, December 28 to 30, 1936. It was divided into sections which deliberated upon special aspects of venereal disease control, and prepared reports. These reports, which were adopted by the Conference as a whole on the third day, were in substance as follows:

The prevalence of syphilis in the United States was estimated at a minimum of 681,000 new cases per annum. It was further estimated that from 5 to 10 per cent of the population is infected with syphilis in its various stages from initial infection to the late sequelæ. It was recognized, however, that available statistical data upon venereal disease are inadequate, and the importance was emphasized of providing more accurate statistical methods in dealing with all aspects of the venereal disease question.

The section on the public health control of syphilis pointed out the necessity for carrying treatment facilities to all persons of all economic strata. While patients should be treated by family physicians and the personal relationship of patient to physician should be maintained wherever possible, it was recognized that the treatment of indigent and borderline patients must of necessity be provided by public health clinics.

Reporting of venereal diseases was emphasized as indispensable to their control, and it was recommended that the Surgeon General request reporting by name and address as in the case of other com-

municable diseases. This recommendation met with opposition, and was amended to the effect that reporting by name and address be encouraged wherever practicable.

A recommendation to the effect that prophylaxis be regarded as an integral part of the syphilis program was opposed from the floor. The opposition, however, was overwhelmingly defeated and the report of the section therefore included the recommendation that prophylaxis be included in the antisyphilis program.

The section on treatment emphasized the importance of early treatment, of the treatment of pregnant syphilitic women, of continuous treatment except in late syphilis in persons of middle or advanced age, of confining the distribution of drugs through public health agencies to such established preparations as the arsenicals, bismuth compounds, mercury ointments and possibly iodide preparations.

In the necessary medical follow-up of the venereal disease patient it was recognized that the services of adequately trained public health nurses or medical social workers must be provided.

The section on cooperation of the private physician pointed out the dual responsibility of the physician—namely to the patient and to the community as in any communicable disease.

The unfortunate lack of uniformity of instruction in syphilology in the various medical schools was a matter of discussion and a resolution was adopted requesting the Surgeon General to refer the matter of undergraduate education in syphilology to the Council on Medical Education and Hospitals of the American Medical Association, and to the Association of American Medical Colleges. Stress was laid particularly on the desirability of carrying postgraduate educational efforts as well as the machinery of cooperation through the channels of organized medicine in the state and the local community.

JOURNAL OF CHILD PSYCHIATRY.—A very welcome and timely addition to periodical psychiatric literature is the *Zeitschrift für Kinderpsychiatrie,* now in its third year in publication. This Journal, published in Basel, Switzerland, is under the editorial direction of Dr. M. Tramer of the University of Bern, with the collaboration of Professor H. W. Maier (Zurich), Professor E. Glanzmann (Bern), Dr. A. Repond (Monthey), Dr F. Braun

(Zurich), Professor J. Wintsch (Lausanne), and D. H. Christoffel (Basel). This bi-monthly periodical is polyglot and contains original articles in German, French, Italian and English; and has presented valuable contributions on all aspects of juvenile psychopathology and the related problems of childhood.

THE AMERICAN JOURNAL OF PSYCHIATRY would like to extend to the *Zeitschrift für Kinderpsychiatrie* its congratulations upon an excellent achievement with the hope for its continued and increasing success.

Book Reviews.

THEORY AND PRACTICE OF PSYCHIATRY. By *William S. Sadler.* (St. Louis: The C. V. Mosby Co., 1936.)

One of the major ills which beset psychiatry is the literal adoption by the psychiatrists of Terence's formula, that nothing which is human is alien to him. This imposes on the psychiatrist the necessity of being a Mr. Know-It-All, which leads more to diffuse glibness than to exactness of scientific approach, experimentation or research. When a man has to spread his authority from human physiology and all its details, including the intricate nervous system, and must blend this vast and difficult field of work with such matters as the understanding of the family; the relationship between husband and wife; the knowledge, treatment and prevention of crime; the understanding of prostitution, homosexuality, frigidity—all the so-called perversions, not to speak of the alleged normal sexual life; when he has to be an authority not only on the conscious life of man but the subconscious and the unconscious; when his job includes analyses of dreams as well as the analysis of gastric juices; when he has to know the operation of the social structure on the urges and activities of man; in short, when he has to be physician, psychiatrist, biochemist, sociologist, and to cap the climax, philosopher, he has either to be superhuman or to fall between the many stools upon which he tries to sit. *Mea culpa!*

In a certain sense, this position of the psychiatrist is not his own fault, although the necessity for selling mental hygiene and psychiatry in its broader sense has played a rôle in creating the difficulties under which he labors. For some reason or other, the community adopts one of two attitudes towards the psychiatrist: either they take the notion that the psychiatrist is someone queer working among the queer, or else he is a God-like man combining the properties of the physician, magician, the seer and the astute social manipulator in one more or less ordinary body.

The book under review suffers from the defects imposed upon it by the ambitious project of the author. No one can deny that he has covered the ground, implicit or explicit in any definition of psychiatry. He has considered everything under the sun in this massive tome of over 1200 pages. The various schools of psychology are outlined. He has made some excursion, quite limited and decidedly defective, into anatomy, neurology and biochemistry. The psychoses, the neuroses and various mental diseases of other types are given consideration. Heredity and its basis is brought into focus in this book. There is a bold excursion into crime, and there are many side issues, such as telepathy which is given a respectable position, as well as many chapters on personality problems which start from the cradle and go on to the grave.

The author is an eclectic. Not only are Freud, Jung, Adler and Meyer brought into his scheme of things, but suggestion, auto-suggestion, re-education, re-modification, socialization, religion and diverse philosophies of life became part of the technique by which the cure of the patient is attempted or brought about. There is much width to the discussion. The reviewer believes there is little depth.

Curious disproportions occur, as for example, the fact that six pages of the 1200 are given to a formal discussion of feeblemindedness and six pages are likewise given to telepathy and mind-reading. The discussion on the inheritance of the mental conditions has much fervor but little fact. Such phrases as these occur in his discussion on heredity: "We are today face to face with a serious problem—one of gigantic proportions. *The menace of feeblemindedness*, insanity, and delinquency is a rising tide, constantly growing in volume, because these enemies of society pass on their faulty mental and moral taints to their rapidly increasing progeny. Must we sit supinely [*sic*] by and let this go on?

"Here we are coddling, feeding, training, and protecting this viper of degeneracy in our midst, all the while laying the flattering unction to our souls that we are a philanthropic, charitable, and humanitarian people. We presume to protect the weak and lavish charity with a free hand upon these defectives, while seemingly ignorant and unmindful of the fact that ultimately this monster will grow to such hideous proportions that it will strike us down; that the future descendants of the army of the unfit will increase to such numbers that they will overwhelm the posterity of superior human beings and eventually wipe out the civilization we bequeath our descendants; and all this will certainly come to pass if we do not heed the handwriting on the wall and do something effectively to stay the march of racial degeneracy; for it is said that even now *three-fourths of the next generation are being produced by the inferior one-fourth of this one.*"

This tone the author maintains for several paragraphs. There probably are more misstatements than one would care definitely to enumerate. Such studies as have actually been done on the feebleminded, for example, show that they have a low birth rate, a high death rate, and this is also true of most types of mental disease. There is nothing in the whole wide world which indicates that the criminal classes have a high birth rate or that they tend to multiply as fast as the normal groups of the population. Furthermore, very definite studies done both here and in Europe indicate that the only increase in the commitment rate of the insane and the feebleminded is among the seniles and this, in certain instances, can be explained by superior hospital facilities. Moreover, no psychiatrist should speak of his subject-matter as constituting a viper of degeneracy; it is hardly the frame of mind for objective study. This attitude the author maintains in this part of his book, but in other sections of the book he becomes quite sentimental and more or less rhapsodic about the same groups which he now denounces with fiery vigor.

He makes other extraordinary statements, as for example, "over 50 per cent of all criminals everywhere are mentally sick," which means nothing unless the term mentally sick is defined, for by his own classification of personality there would certainly remain no normal personalities in the world and the percentage of abnormal personalities among college professors and psychiatrists would equal those in a prison.

Thus, he starts off with a beautiful section on self-realization, "The purpose of all biologic drives is self-realization," which apparently means practical adjustment of self to society. Then he goes on to define the type of person who refuses to grow up emotionally, that is, who persists in the maintenance of emotional immaturity, and he gives a list of twenty-four types, starting with "1. Men who can love a woman for only a brief period," including "4. Women who, although they do not believe that women are inferior to men, so behave as to indicate that they are"; "6. Religious and social workers who allow undue sympathy to influence their judgment and decisions in welfare work and charitable ministrations"; "10. Ministers whose 'hearts bleed' and teachers who are always 'threatening'"; "17. People who are always indulging 'pet peeves,' who are annoyed when their plans are interfered with, who must always have their own way to be happy"; "22. Those who like flattery as when their friends puff them up with adulation"; "23. Those who like to do things just to have their own way and manifest stubbornness and vengefulness" . . . . He might not have stopped there; he might have included authors who write books which spread themselves over the map and critics who criticize the authors. The classifications have no real basis. Sometimes they are very clever; generally they are quite astonishing.

The discussion on such important matters as vagotonia and sympathetico-tonia is limited to a few short sentences, many of which are wrong. There are some curious statements made apparently *ex cathedra* throughout the book. A sample occurs in the section on the control of fatigue, in which the author differentiates between *physiologic fatigue* and *neurologic fatigue;* the former he says is due to the accumulation of acid poisons in the body, a statement which no physiologist would substantiate as having the slightest validity, and the latter is psychic, a state of mind, a habitual sensation. He then states, "*Sleep is an antidote for work but not for worry.* Sleep relieves physiologic fatigue, but not psychologic." Just what the author's experience has been to make this statement, the reviewer does not know, but certainly people who are worried sleep and often feel better when they awake, and people who are suffering from psychic fatigue—whatever that may be—may be refreshed. What would be better to state is that worry disturbs sleep; that abnormal fatigue brings a change in the ability to rest and recuperate. In other words, the author has reversed the situation besides indulging in generalities which cannot possibly be justified. At the same time in this particular section the author makes very pertinent and shrewd clinical observations.

One might go on endlessly discussing this book. On every page there are statements which annoy and irritate because of their glib solution of un-

solved problems, and statements which seem quite pertinent and show good clinical insight and judgment. The headings over the case histories are journalistic and decidedly deceptive, as journalistic headings are apt to be. Something is selected which is only part of the case, as for example in the case which the author uses to illustrate the inferiority complex, in which a large nose has become the center of the patient's obsessive state.

The author is quite selective in his discussion of problems. Thus, in his discussion of the failure of correctional methods in crime, he quotes the Drs. Glueck and their proponent, Dr. Cabot, but does not ever mention in his account the storm of criticism which burst upon the Gluecks, and which quite clearly demonstrated that their book did not reach the heart of the problem in the least. The author then disposes of criminal psychology in one paragraph with the following nine statements:

"1. An attempt to escape from fear—social and economic.
"2. A protest against deprivation—real or imaginary.
"3. A gratification of secret longings.
"4. A drive for freedom—a quest for liberty.
"5. An outbreak of long-repressed impulses.
"6. A disguise for more serious offenses against selfhood.
"7. A sudden eruption of suppressed hatred.
"8. An expression of chronic suspicion.
"9. An exhibition of egocentricity."

Not one nor all of these qualities which he describes but what are present everywhere in the population, and certainly there is nothing like scientific proof, nor even an attempt in this direction. The reviewer would advise the author to read the brilliant discussion of the causes of crime by Pluscowe in the Wickersham report. There he will discover that the matter of the causation of crime and even the type of personality which engages in crime are unsolved problems, and that all of the conclusions, which he so facilely reaches, have no basis.

The book shows the author to be a clinician of wide experience and undoubtedly effective as a practising psychiatrist. This book shows enormous diligence and energy. The style too often points with alarm, too quickly shifts from the factual to the exhortatory, and the author's attitude is a mixture of scientist in very small percentage, preacher in a fairly large percentage, an easy philosopher in a still larger percentage. This mixture is uncomfortable in a book dealing with a medical subject. In fact, the medical attitude is quite submerged. Thus, in the discussion of alcohol nothing is said of vitamin deficiency.

The reviewer has summarized the present situation in psychiatry in a recent paper on "Error in Psychiatry" by the statement, "In the present state of its knowledge, psychiatry needs research, research and research. It also needs the humble, diligent spirit." The author of this book has exemplified the diligent spirit but the humble one is nowhere in evidence.

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FÜRSORGE FÜR DIE GEMÜTS—UND GEISTESKRANKEN IN DER SCHWEIZ. By *Dr. H. Bersot.* (Bern: Hans Huber, 1936.)

This brochure of 175 pages describes the facilities for the care and treatment of the mentally ill in Switzerland. It was written primarily for the information of the nursing personnel in the Swiss mental hospitals but, as a reference work, will be of interest to a much wider public.

Switzerland, with a population of 4,100,000, has 25 public and 21 private mental hospitals and 3 for epileptics. In December, 1934, the patient population was 15,451, with 91 per cent cared for in the public hospitals.

The institutions are all referred to, but attention is chiefly given to the newer features in construction and internal arrangements that have developed in recent years.

Very complete data concerning the patients are supplied and the modern methods of treatment are discussed. These include rest and isolation, hydro- and electrotherapy, sleep, fever and insulin treatment, the use of drugs, psychotherapy and occupational therapy.

The medical and nursing services are dealt with and the extra-hospital activities of psychiatric significance are described. The latter include the work of aid societies for the mentally ill, the boarding-out system, the psychiatric and neurological out-patient departments, the medical-educational services, the work of societies interested in the abnormals and alcoholics, and the work of The National Committee for Mental Hygiene.

The text is supplemented by 131 excellent illustrations. Some of these are views of institutions, or show special features in construction; others portray occupational activities and various treatment measures, and many maps and tables illustrate points made with reference to patients and personnel.

An appendix lists the various mental institutions with the names and addresses of the directors, the committee of the Swiss psychiatric and related societies, and the scientific journals with their editorial boards.

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AN ENQUIRY INTO MORAL NOTIONS. By *John Laird.* (New York: Columbia University Press; London: G. Allen & Unwin, 1936.)

This is the latest contribution to philosophic discussion, by the well-known Aberdeen professor. It will be of special interest to professional philosophers or ethicists, but the clarity of its analyses and descriptions, and the effectiveness (and geniality) of its illustrations, make it intelligible and interesting for the more theoretically-minded public as well.

The moral notions which he here examines, are the familiar centres of ethical discussions, viz., Virtue, Duty and Benefit. There is special interest to the present enquiry however, in the unusual point of view from which they are examined, and the result this makes possible.

The more usual method of treating these notions has been to single out some one of them as giving the fundamental meaning of "goodness," and then to explain the goodness and the development of the other two in terms of this one.

By contrast with this, Professor Laird contends (following the emphases made again recently by Sidgwick, Moore and McTaggart) that in ethics, the fundamental sense of the word "good" is what he calls the "axiological" sense, and that this does not depend upon any one of Virtue, Duty or Benefit either logically or historically; he adds that it is not even limited to the field of morals. This (axiological) sense of "good" is often expressed by the terms "worth" or "value"; it is known by insight, not by mere feeling; it is the sense in which one may properly enquire as to whether a virtue, a duty, a benefit or morality itself, is good.

From this point of view the author can and does undertake to exhibit the (axiological) good of virtue, duty and benefit, respectively, without presuming one of them fundamental; this enables him also to conclude as he does, that no one of these is sufficient, but that each has its distinctive and necessary contribution to make, to full moral goodness.

The "enquiry" does not attempt to deal with the applications of this view to the "practical" problems of politics, sociology or psychology. There is, however, much that is of interest for the background of these problems in, *e. g.*, his treatment of the psychological "springs of virtue and their expression," in his classification of Virtues and Goods, and in his treatment of "Character" (Ch. I) and of "Will." The relation of this axiological sense of good given by "insight," to the problem of the selection of practical norms, would also be interesting to develop; our author contents himself in this work however, with the description and evaluation of these fundamental features of the situation, without pursuing such further questions as to what may be done about or with them.

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APHASIA. A Clinical and Psychological Study. By *Theodore Weisenburg, M.D., and Katharine E. McBride, Ph.D.* (New York: The Commonwealth Fund; London: Humphrey Milford, and Oxford University Press, 1935.)

This work is largely the presentation of a series of cases demonstrating aphasic syndromes in various forms. The authors have abandoned the usual terminology for their conception of the condition and have developed and suggested a classification of expressive, receptive, expressive-receptive and amnesic forms to indicate the conditions usually understood as sensory and motor aphasia. Perhaps there is more justification for the amnesic subdivision than for the others used. One does wonder if it is not a case of overburdening a nomenclature in the field of human intercourse which is already ill-defined and not conclusive. There are sets of tests, which, while elaborate, may and no doubt will be added to from time to time in the future. The authors very aptly and properly draw more attention to the examination and behavior of the normal in order to give more definite conception of the average for comparison. There is no more evidence that conclusively localizes cerebral aphasic functions than that which is already

the basis of the present day conceptions but the authors perhaps very properly suggest that they do not want to be too arbitrary even as to these locations. The first part of the book is devoted to an excellent critical survey of the accepted ideas on aphasia and an outline of the history and development of the condition. This book will well repay perusal by those interested in the fields of neurology and psychiatry. There is an excellent bibliography. After surveying this work, one can only regret that Dr. Weisenburg's life was not spared to continued this fine piece of investigation.

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PERSONALITY MALADJUSTMENTS AND MENTAL HYGIENE. By *J. E. Wallace Wallin, Ph. D.* (New York: McGraw-Hill Book Co., 1935.)

In a book of some 510 pages Wallin covers a rather formidable range of material and gives considerable, well-catalogued information. His training and experience in the fields of psychology and education provide the background for a volume which extends somewhat beyond these limits.

According to the preface: "This book is the outcome of the first-hand investigation of numerous cases of mental defect, disabilities, and adjustment difficulties, and of the perusal of a wealth of technical memoirs, monographs, and books in the field of personality defects and mental hygiene. It first appeared in the form of lectures on personality maladjustments and mental hygiene offered both to popular audiences and to students in courses in a number of universities."

The main body of the book is divided into two parts: Part I dealing with mental health and mental hygiene; Part II with personality maladjustments. Part I opens with a discussion of the psychophysical unity of the human organism, then turns to psychotherapeutics and the evolution of a wholesome personality. In the second chapter, the three fundamental objectives of a mental hygiene program are considered: remedial, preventive and positive (preservative). Following this there is an interesting chapter on physical, psychological, social and educational factors in mental hygiene. As the author progresses he makes reference to the principles underlying the better known schools of psychoanalytic psychology and, toward the end, carefully lists what he considers to be the contributions of psychoanalysis to child guidance. As a matter of fact, children and their problems are referred to under numerous headings.

The second part of the book offers an elaborate discussion centering upon a series of fifteen more or less faulty methods commonly employed in solving personal difficulties. These methods include trial and error, dodging responsibility, making light of difficulties, refusal to acknowledge defeat, self-justification, procrastination, rationalization, regressive adjustment, retreat into phantasy, compensation, inhibition, repression, substitution and sublimation. The (often) unfortunate consequences of their use together with preventive and remedial suggestions are illustrated with brief case histories from the writer's voluminous files.

Wallin does not attempt to advance any radical theories or foster any startling innovations. Most of his material is presented from the point of view, first, of an educator, second, of a clinician. He has succeeded in writing a text-book which gives a broad view of divers clinical subjects without attempting to exhaust any of them. The style is such that a minimum of preliminary training should serve to make the material both intelligible and interesting.

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THE PATIENT AND THE WEATHER (Vol. I, Part II). Autonomic Integration. By *William F. Petersen, M.D.* (Ann Arbor: Edwards Brothers, Inc., 1936.)

It is difficult to do justice to this volume, which follows Volumes II and III in point of time of publication, and which represents an immense amount of work dealing with the constitutional reflections in "normal" individuals, of changes in the meteorological environment. It deserves the most thoughtful consideration from all who practise medicine in any of its branches; its central thesis is so steeped in the mists of antiquity that this racial wisdom, studied in the light of modern knowledge, will repel some by reason of its very novelty, but those readers who remember that one treats the patient, and not the disease, will be rewarded for their time.

The text is concerned with the autonomic reactions—chemical, hormone, and nervous—of the organism, in response to changes in the meteorological environment, for the atmosphere is considered to be a major force in every human reaction. Local and seasonal variations in the barometric pressure have their influence upon the soma, and the apparent paradox is brought out, that oxygen inadequacy occurs with rising barometric pressure. In the same way, the effects of temperature oscillations and gradients, atmospheric moisture, winds and sunshine, are studied.

The "region of most severe autonomic demand" includes the American North-West, whence it extends southward from the Canadian border to Colorado, and eastward to New England and the St. Lawrence valley. Within this area, according to Dr. Petersen, "The regions 1, 2, and 3 (respectively the Pacific North-West, the mid-western region, and the New England States), form distinct nuclei of greater autonomic demand, and the population at large reflects this autonomic demand by obvious fatigue, dysfunction, and inadequacy."

Meticulous laboratory studies were carried out, correlating changes in atmospheric environment with observed changes in the chemistry of the blood and urine, blood cytology, blood pressures, metabolic rates, gas exchanges in blood and tissues, temperatures, etc., as well as changes in moods and emotions, all tending to prove the meteorological genesis of the metabolic tide, the alternating swings between "Anabolism—Reduction and Vascular Spasm" and "Catabolism—Oxidation and Dilatation of the Vascular Bed." Nevertheless, the author is not unmindful of the influence of diet, emotion,

sex and constitution. Through reasoning which, to the physiological chemist may seem tenuous, there is propounded the thesis that the instability of the leptosome is part of a vicious circle. "The more poorly buffered he (the unstable individual) is, the greater will be the tendency to exaggerated pressor episodes. Anoxemia will be augmented. Greater anoxemia . . . . more rapid fat and protein breakdown. The less accumulation of reserves, the less the buffering, the greater the instability, the more anoxemia."

In the female, the varying influence of meteorological changes upon the sex cycle was investigated; while it was also established that in psychopathic individuals, the swings were more marked. Children of both sexes, typhoid carriers, and laboratory animals were also studied along the same lines.

All in all, the book is one to be recommended as both informative and stimulating.

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HISTORICAL NOTES ON PSYCHIATRY. By *J. R. Whitwell,* M. B. (London: H. K. Lewis & Co., Ltd., 1936.)

An interesting volume, wherein the Honorary Librarian of the Royal Medico-Psychological Association seeks "to convey within a moderate space (252 pages) some idea of the process of evolution through which psychiatry has passed from early times to the end of the sixteenth century."

Pointing to the close relationship between the status of civilization of a community and the attitude of that community to mental disorder, the author cites various backward localities throughout the world today where symptoms of disturbed functioning of the mind or of the nervous system are attributed to demoniacal possession to be treated by priestly exorcism or magical rites. Such a case occurred in Rheisbach on the Rhine as lately as 1927 where the villagers gathered around the cottage of a girl believed to be possessed of an evil spirit which they tried to drive away by beating on pots and pans and raising general clamor. This country furnishes still more recent examples in the Hexerei proceedings in the backwoods of central Pennsylvania within the past two or three years.

From the world's literature there are here assembled a multitude of items of psychiatric interest—notes from ancient Chinese medicines, references in the sacred writings of India, extracts from the medical papyri of Egypt, psychotic material from the Old and New Testament (the author courageously and elaborately interprets Pharaoh's dream), and somewhat extended quotations from classical historians, poets, dramatists and philosophers.

In a chapter of 42 pages the author discusses some of the outstanding classical medical writers, especially Hippocrates, Celsus, Aretaeus, Galen, Trallianus, Avicenna, Plater.

An interesting section is devoted to the history of certain special forms of mental and nervous disorder. One of these is epilepsy to which the author assigns a startling significance as the disease "selected by Hippocrates in order to make the definite pronouncement to the world in general, and the

medical world in particular, that neither this disease nor any other had anything divine in its origin, and thus to lay the foundation of scientific medicine." Despite the foundation thus well and truly laid, "credence in the divine origin of epilepsy persists up to this day in countries which commonly pass as 'civilized.'" The record of the opinions which have been held concerning this disability, the names which have been attached to it, the measures invented to combat it, reflect not only the whole story of medicine as a science trying to be born, but as well the drama of social evolution and the painful odyssey of the human intellect muddling through the ages. Among the fifty and more titles which have been conferred upon the convulsive disorders we find such striking binomials as *morbus sacer, morbus infernalis, morbus magnus, morbus Herculens, morbus lunaticus, ira dei, ignis divinus, ignis inferni,* the falling evil, the holy grief. Interesting is the identification of opposites as illustrated by some of these antithetic pairs of names. In mediæval times epilepsy was regarded as a contagious disease, and in 1486 a hospital for the *isolation* of epileptic patients was established at St. Valentines in Alsace.

The forefathers were much concerned too with the nocturnal malady called *incubus,* now less elegantly styled nightmare. The distressing nature of this delusion of the middle ages is not easy for the modern mind to realize. The possible physiological factors involved were discussed by the medical men of the times while the specific sexual features were amply dilated upon by the theologians.

Another disorder described during, but certainly not peculiar to, the dark ages was *acedia* (the "not-caring" state), which "seems to have appeared in a certain proportion of young initiates of either sex after their entry into monastic life." From the descriptions it is probable that *acedia* included hysterical, depressive and schizoid reactions.

The second part of this volume, comprising about 100 pages, is given over to translations and extracts from medical and other learned writers from Hippocrates down to the end of the sixteenth century which the author has culled from books in the libraries of the Royal Medico-Psychological Association, the Medical Society of London, the Royal Society of Medicine, the Royal College of Physicians and the British Museum. These selections, while not exhaustive, do represent the trend of opinion of representative men from generation to generation, and the author has rendered a service in bringing them together in this convenient form.

The book presents a useful epitome of the salient features of psychiatric history.

C. B. F.

WILLIAM H. MAYER.

1887-1936.

In Memoriam.

WILLIAM H. MAYER.

1887-1936.

The passing of Dr. William H. Mayer of Pittsburgh removed a physician and a friend. He was born in Pittsburgh, the son of the late William L. and Anna Beckman Mayer, his father being a well-known musician. He received his early education in Pittsburgh and was graduated from the University of Pennsylvania Medical School in 1912, after which he interned at the Mercy Hospital in Pittsburgh and became associated with Dr. Edward E. Mayer for several years. He was the neuropsychiatrist to the Allegheny General and Passavant Hospitals, psychiatrist to the St. Francis Hospital, and assistant professor of neurology at the University of Pittsburgh Medical School.

He was a member of the Allegheny County and Pennsylvania State Medical Societies; fellow of the American Medical Association; fellow of The American Psychiatric Association; member of the Association for Mental and Nervous Research; member of the Pittsburgh Neuropsychiatric Society; fellow of the American College of Physicians and Pittsburgh Academy of Medicine, also a member of the Phi Beta Pi Fraternity.

Early in his medical career Dr. Mayer showed intense interest in medical affairs from the standpoint of organization and was a stalwart defender of medical organization as well as its traditions. He served as secretary to the Allegheny County Medical Society (1917-25) and as its president (1925). He was also president of the Pennsylvania State Medical Society in 1931. He had been a delegate to the House of Delegates of the American Medical Association from 1921. For several years he was chairman of a special committee created by the board of trustees of the American Medical Association to cooperate with the Secretary of the United States Treasury on problems pertaining to medicinal alcohol. He also was a member of the compensation board appointed by the state medical society to cooperate with the state compensation board.

In the past few years he was considerably engrossed in medical economics and was much opposed to radical socialization measures. At the time of his death he was the chairman of arrangements for the coming American Psychiatric Association convention in Pittsburgh.

His interests were many and he was active until three days before his death. At an early age he became incapacitated due to syringomyelia, but persisted through medical school and the ever-constant pain he suffered was never discussed by him with even his closest friends. His diagnostic acumen was astounding. Despite his disability he conducted his own neurologic examinations in detail. His insight into psychiatric problems was well known.

He was very popular throughout Pennsylvania and was constantly invited to address both lay and professional groups. He was away from his office for long periods, preferring to expound individualism in medical practice. His address as president of the state medical society typifies this individualism. His repartee was well known. He had a keen mind, was exceedingly observant, and was well informed. His wit was incomparable. His chief hobby was classical music and this he undoubtedly inherited from his family of musicians. He was a perfect host.

He always stimulated interest in research, while deploring his inability to perform those technical experiments he nurtured because of his disability. He was a voracious reader. He was one of the few who decried new ideas until most conclusively proven.

His assets were many, his liabilities few. He faced life and its handicaps with sublime courage. Never complaining, he was very sympathetic and understanding to his friends as well as patients. He was loyal and devoted to medicine and medical organizations. He knowingly never failed anyone. His motto was to serve and that he did ably.

WILLIAM SHAPERA, M. D.